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BRITISH ANIMALS.

A

HISTORY

OF

BRITISH ANIMALS,

EXHIBITING THE

DESCRIPTIVE CHARACTERS AND SYSTEMATICAL
ARRANGEMENT

OF

THE GENERA AND SPECIES OF QUADRUPEDS, BIRDS,
REPTILES, FISHES, MOLLUSCA, AND RADIATA
OF THE UNITED KINGDOM;

INCLUDING

THE INDIGENOUS, EXTIRPATED, AND EXTINCT
KINDS, TOGETHER WITH PERIODICAL
AND OCCASIONAL VISITANTS.

BY

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PREFACE.

The study of British Zoology is peculiarly attractive to the intelligent observer of nature in this country, by the facility with which many species, in the different groups of animals, can be procured for accurate examination. Their forms, structure, and successive developement, can be traced in detail, together with the functions which they exercise, and the various circumstances by which they are controlled. In this manner just conceptions of the laws of organization, and the limits to the distribution of the species, may be acquired, and the mind qualified for speculating on the more extended relations of the animal kingdom. A valuable collection of facts will likewise be secured, by which the most fascinating generalisations may be tested—those productions which, like a map, should always be received with suspicion, if inaccurate within the sphere of individual observation.

These views have long exercised an influence in this country, and given rise to those various attempts to enumerate and describe British animals, which, for more than a century, have been presented in succession to the public. During this extended interval, the science of zoology has experienced several remarkable changes, each producing a corresponding effect on the British Fauna. If anatomy and physiology be regarded as the basis of zoological science, the history of species will include a description of their structure and functions, along with their external characters. If anatomy and physiology be discarded as foreign to the subject, and the professed naturalist acknowledge, without a blush, his ignorance or his contempt of both, then the history of species will be chiefly occupied with the details of external appearance. Such different conditions have prevailed in the science of zoology in this country, and justify the division of its history into two great eras, the general features of which it may be proper here briefly to notice.

The first of these periods in the history of zoological science in Britain, may be denominated the PHYSIOLOGICAL ERA. In this golden age WILLOUGHBY, RAY, LISTER and SIBBALD conspicuously distinguished themselves. These illustrious individuals duly appreciated the value of anatomy as a guide in zoological inquiries; and while they studied the forms of animals in connection with their structure, they were not unmindful of their functions and distribution. The whole extent of the animal kingdom occupied their attention, and they were induced to collect materials from every quarter. But while thus engaged, they were sedulous in the investigation of the productions of their own country. The number of indigenous species which they procured and described, is a proof of their diligence, and enabled them to impart a degree of maturity to the British Fauna at that early period, which is still calculated to excite our admiration.

The labours of these luminaries of the science in determining the characters of British Animals, were preceded by the publication in 1667 of the "*Pinax Rerum Naturalium Britannicarum*" of Dr CHRISTOPHER MERRET. This small work, which, though it claims little more than the merit of a catalogue, exhibits many proofs of great diligence, and rises in importance, when viewed as a first attempt at the construction of a British Fauna.

The history of MAMMIFEROUS Animals was undertaken by JOHN RAY, and the results published in 1693, in the *Synopsis methodica Animalium, Quadrupedum, et Serpentini generis.* In this work, the forms of the native species are described with much accuracy, together with many interesting anatomical details. Few opportunities had occurred to this author, or to his friend WILLOUGHBY, of examining the Cetaceous species. This deficiency, however, was well supplied by Sir ROBERT SIBBALD, a naturalist who, besides contributing greatly to the elucidation of the productions of his native country by his *Scotia Illustrata, sive*

Prodromus Historiæ Naturalis, &c. Edin. 1684, and his *History ancient and modern of the Sheriffdoms of Fife and Kinross*, Edin. 1710 (the 8vo edition, Cupar, 1803, is the one now generally quoted), had bestowed much attention on the characters of the different kinds of whales which had been captured in the Scottish seas, or stranded on various parts of the coast. His *Phalainologia Nova*, Edin. 1692, rescued this department of zoology from the obscurity in which it had previously been involved. A reprint of this work, at the instigation of Mr PENNANT, took place in 1773, and is the edition now in general circulation.

The BIRDS of Britain were enumerated and described with great precision in the *Ornithologia* of FRANCIS WILLOUGHBY, a work edited, after the death of the worthy author, by RAY in 1676. An English translation was at the same time published, with some additions; and, in 1713, an abridgement made its appearance, under the title *JOANNIS RAII Synopsis methodica Avium; opus posthumum;* edited by the venerable DERHAM.

The native REPTILES are few in number, and are well described by RAY in the Synopsis already referred to. Few additions of any value by subsequent authors have hitherto been communicated.

FISHES occupied the attention of WILLOUGHBY. His *Ichthyologia*, as edited by RAY, Oxford 1686, is a work of great labour; and the descriptions, especially of British species, are models of precision. A few additions were afterwards made to this division of the British Fauna by RAY in his *Synopsis methodica Piscium*, London 1713, chiefly from the contributions of the Rev. GEORGE JAGO of Loo.

While the History of the Vertebral Animals was thus assiduously cultivated by individuals well qualified for the task, the Invertebral kinds were not overlooked.

The MOLLUSCA were diligently investigated by MARTIN LISTER, and the descriptions of many species in the *Cochlearum Angliæ Historia*, which forms a part of his *Historia Animalium Angliæ*, London 1678, are minute and illustrative. But the greatest service which LISTER rendered to this department of science arose from the publication in 1685 of his *Historia sive Synopsis methodica Conchyliorum*. The plates of this valuable treatise exceed a thousand in number, and were executed with taste and accuracy by the author's accomplished daughters, ANN and SUSAN. Two editions of this work, the one by the Reverend WILLIAM HUDDESFORD, and the other more recently by Mr DILLWYN, are those now generally referred to.

Among the Annulose animals, the SPIDERS had early attracted the notice of LISTER, and his descriptions of the species, as published in the first part of his *Historia Animalium Angliæ*, are still unrivalled. The study of Entomology had been facilitated, to a certain extent, by the appearance of the *Theatrum Insectorum* of MOUFET, London 1634; but it is to the *Historia Insectorum* of RAY, London 1710, to which LISTER furnished a valuable contribution, that the science was chiefly indebted for its early success, and the popularity which it still maintains among the naturalists of England.

The true nature of the ZOOPHYTES was but imperfectly comprehended by zoologists throughout the period in which the eminent individuals, now enumerated, continued to flourish. At length, however, this interesting group of animals received ample illustration from the meritorious labours of JOHN ELLIS, whose *Essay towards a Natural History of the Corallines*, London 1755, may be regarded as the last of the productions of the old school of British Physiologists.

It is painful to advert to the second era of British Zoology, during which the ARTIFICIAL METHOD of LINNÆUS occupied that place which physiology had so successfully filled. We must be careful, however, to make a distinction between the precepts and example of LINNÆUS himself, and the conduct of his blind admirers. LINNÆUS regarded the Natural Method, which contemplates form, structure, and function, as the ultimate object of the science of Zoology. His Artificial System, in which external appearances were exclusively employed, was devised as a convenient instrument of research to guide the student in attaining higher objects. Too many of the followers of the illustrious Swede, in this country, seem to have viewed the Artificial Method, not as the instrument, but the object aimed at,—overlooked results in physiology which industry had already secured, and presented the science under an aspect which a cultivated mind could not relish, and in which an ordinary observer could perceive little utility. In this retrograde movement of British naturalists Mr Pennant led the way, and the completion of his *British Zoology*, in four volumes, in 1777, gave a new aspect to the science in this country. This naturalist possessed favourable means for study, and no inconsiderable share of industry; but being rather deficient in a knowledge of physiology, he unfortunately seems to have undervalued all that his predecessors had gleaned in that fruitful field, and confined his labours chiefly to an acquaintance with the external characters of animals. He succeeded in imparting to his writings a considerable degree of popularity, by avoiding all minute details, and introducing occasional remarks on the habits of particular species; and by allusions to Greek and Roman authors, he interested the classical reader. In his account of the Vertebral Animals, his materials were chiefly derived from the writings of Willoughby, Ray, and Sibbald, while Lister supplied the groundwork of the Shells. It is in the class Crustacea that Mr Pennant appears chiefly as an original author, earning reputation in a department of the science which his predecessors had in a great measure neglected. The Spiders, Insects, and Zoophytes, did not engage his attention.

In order to facilitate the researches of the student of British zoology, Dr Berkenhout published abridged characters of the species in 1769, under the title "*Outlines*," *&c.* and a third edition more enlarged, in 1795, included in the "*Synopsis of the Natural History of Great Britain and Ireland.*" In the first volume of this work, the characters of the species of British Animals are drawn up with a degree of care and accuracy unequalled in any subsequent publication of a similar kind. In 1802 Mr Stewart attempted a similar work, on a more enlarged plan, in two volumes, entitled *Elements of the Natural History of the Animal Kingdom.* This work includes, besides the British species, the characters of the more common genera of foreign animals. A new edition appeared in 1817, deficient, however, in the account of the more recently published species, and in some instances faulty by introducing the same species twice under different genera.

In the translation of GMELIN's edition of LINNÆUS's System of Nature, London 1802, Dr TURTON has marked with an asterisk all the species which he considered as indigenous to Britain. This list is by far the most extensive of any which has yet appeared. The same industrious naturalist commenced in 1807 a *British Fauna*, including the classes Mammalia, Birds, Amphibia, Fishes, and Worms. He has since still further illustrated the Shells of this country in his *Conchological Dictionary*, and his still more valuable *Bivalvia Britannica*.

Besides the authors now referred to, who aimed at the completion of systems of British Zoology, other naturalists, equally the followers of the Artificial Method, directed their attention to the elucidation of particular tribes of indigenous animals. As works of luxury in this department, may be noticed the figures published by ALBIN, EDWARDS, LEWIN, and last of all those of DONOVAN, whose various publications have greatly contributed to advance the interests of the science, by facilitating the *naming* of species.

But there were other labourers during this era, whose efforts assumed a more scientific aspect. The late GEORGE MONTAGU, Esq. of Knowle House, Devonshire, cultivated with zeal many departments of British Zoology. In 1802 he published his *Ornithological Dictionary*, which contained a few amended characters of species, and some new observations on their economy. In 1813 a *Supplement* to this Dictionary appeared, in which the author exhibited a more intimate acquaintance with his subject, traced the effects of age, sex, and season on the plumage of birds, and exposed many mistakes in the establishment of species, which had been committed from a want of attention to these circumstances. But Mr MONTAGU's labours were not confined to Ornithology. In 1803 the publication of his *Testacea Britannica* contributed greatly to extend a knowledge of the number and characters of the native Molluscous animals, and which was still further augmented by the *Supplement* to the same work, which appeared in 1808. It is but a just tribute to the candour of this naturalist to state, that in his writings he appears, progressively, to have been forsaking the Artificial Method, and acquiring a keener relish for physiological researches. That truth was at all times eagerly sought after, a frequent correspondence with the author during several years furnished suitable opportunities for ascertaining.

In the science of Entomology, several meritorious efforts were at this time made to illustrate the characters of the native species. The *Entomologia Britannica* of MARSHAM, London, 1802, embraced the extensive tribes of Coleopterous Insects, and in which he described many new species, and greatly elucidated the characters of those previously known. In the following year, Mr HAWORTH commenced his *Lepidoptera Britannica*, a work containing much important information; but now, from its scarcity, of difficult access to the student.

It was not to be expected in a country in which such anatomists as HARVEY and TYSON, and such zoologists as WILLOUGHBY, RAY, LISTER, and SIBBALD had flourished, that the Artificial Method would universally supersede the study of the anatomy and physiology of animals. During this dark age, one individual, JOHN HUNTER, upheld, in his own labours, the dignity of the science, and left behind him a *museum* which, to this period, is unrivalled as a display of zeal, patience, and physiological attainment. At the same period, the University of Edinburgh possessed, in Dr MONRO *secundus*, a comparative anatomist and physiologist, anxious to inspire a taste for the science in the minds of his numerous pupils, and to extend its boundaries by personal exertion.

Even among the naturalists of this country, there were always a few whom the fetters of the Linnean school could not bind; but whose labours were too confined in their object, to exercise any general influence on the spirit of the age. Mr KIRBY, in his *Monographia Apum Angliæ*, Ipswich, 1802, set an example to his countrymen of acuteness and patience in unfolding the structure and habits of those insects to which he had directed his attention; and he has recently increased his claims to the gratitude of British naturalists, by composing, along with Mr SPENCE, the *Introduction to Entomology*. In another quarter of the island, Mr DALYELL, in his *Observations on Planariæ*, Edin. 1814, exhibited a happy facility of investigating the habits of aquatic animals, and many valuable results yet remain in his possession, which it is hoped he will soon communicate to the public.

The circumstance, however, which contributed, in the greatest degree, to restore the science to its former dignity, in this country, arose from the influence of the writings of the continental naturalists. Unrestricted by those trammels which had paralysed the exertions of British zoologists, they had followed in the track of the Natural Method, under the banners of REAUMUR, DEGEER, MULLER, DAUBENTON, and FABRICIUS; and more recently under the guidance of BLUMENBACH, RUDOLPHI, TEMMINCK, CUVIER, LATREILLE, and SAVIGNY. A comparison of the productions of these modern observers, with those of the disciples of the Linnean school, could not fail to exhibit the former in a favourable light, and gain converts to the pursuits of physiology. In this new field, Dr LEACH has occupied a prominent place. His situation as zoologist to the British Museum, furnished him with invaluable facilities; and there are few unacquainted with the successful results. He began by publishing several articles on annulose animals, in the Edinburgh Encyclopædia, and the Supplement to the Encyclopædia Britannica, which have been republished, under his inspection, by Mr SAMOUELLE, in the *Entomologist's Useful Compendium*, London, 1819. The *Zoological Miscellany* was begun by Dr LEACH, in 1814; and, in the following year, the *Malacostraca Podophthalmata Britanniæ*, imparted a new character to an obscure branch of British Zoology. He had likewise, in considerable forwardness, a *Mollusca Britannica.* It is deeply to be regretted, that indisposition has hitherto prevented its publication, since it is confidently believed that his labours in this field would have removed much of that uncertainty which still prevails in the classification of molluscous animals.

The Insects of Britain are at this moment receiving ample illustration, according to the modern improvements of the science, in two works, in the course of publication. In the *British Entomology* of Mr CURTIS, there is exhibited a fortunate dexterity in developing structure, accompanied with great accuracy of delineation. The *Illustrations of British Entomology*, by

Mr Stephens, is a work daily exhibiting the vast resources of his rich cabinet, and his discriminating acquaintance with the indigenous species.

Besides these displays of increasing attachment to the improvements which have been effected in the science, several circumstances have recently occurred in London, which seem calculated to promote the advancement of zoology in this country. The *Zoological Club*, instituted 29th November 1823, on the birth-day of Ray, will, it is hoped, give a new energy to those members of the Linnean Society, who devote their attention to the subjects of the animal kingdom. The establishment of a *Zoological Journal*, in 1824, is not without its interest, as indicating, we hope, an increasing demand for the truths of the science, and an anxiety to trace its progress. The *Zoological Institution*, organized 22d June 1825, under the auspices, and by the persevering exertions, of the late Sir Stamford Raffles, does honour to the spirit of the age. Botanic and Horticultural Gardens had long been established, and plants collected from various quarters for inspection, study, and application to purposes of utility or ornament. Now, the Animals of different countries will be subjected to similar treatment, and the happiest results may be anticipated. Nor can it be forgotten in this place, that a *Professorship of Zoology* has at last been instituted in the United Kingdom, and that the University of London has set the example.

Amidst so many displays of zoological zeal, it appeared to the author that a compendious view of the characters of British Animals would be useful in promoting the progress of the science, and as a substitute for more extended disquisitions. In 1822, he had ventured to publish the *Philosophy of Zoology*, in which it is attempted to collect and classify the truths of physiology, and to point out their importance in illustrating the characters of those groups into which animals have been divided. He there stated, that the Fauna of a country should embrace Resident Animals, Periodical Visitants, Stragglers, together with the Extirpated, Extinct, and Naturalized Species. In the construction of the present Work, these important distinctions have been kept in view.

The *Resident Animals* are such as can accommodate themselves to all the changes of this variable climate. They are the only species which strictly merit the epithet *Indigenous*.

The *Periodical Visitants* chiefly belong to the class of Birds Some of these come from more southern latitudes, to spend the summer, and bring forth their young; while others arrive from more northern latitudes, to escape the rigours of an arctic winter. The vernal shifting the author has denominated *Equatorial Migration*, the autumnal shifting the *Polar Migration*. All the species of these groups, though intimately connected with the country, by the regularity of their visits, enjoy a right of citizenship less perfect than the resident animals.

Stragglers, or irregular visitants, have hitherto occupied a higher rank in every British Fauna, than they seem entitled to possess. Driven from their native haunts to this country by some temporary calamity, the persecution of foes, or the fury of a storm, they have been recorded inconsiderately as indigenous species. Their occurrence, as serving to illustrate the distribution of species, should be recorded, but not in such a manner as to assimilate them with the resident kinds, and periodical visitants. Acting upon this principle, the author has been compelled to degrade to the rank of Stragglers, several Birds and Fishes which have long occupied a more distinguished place.

The *Extirpated Animals* are such species as still maintain their ground in other regions, but have been destroyed in this country by the long continued persecutions of man.

The *Extinct Animals* are such as once dwelt in this country, but which have disappeared, and, from various causes, seem to have perished from off the earth.

The remains of the extirpated animals, or such as history records to have lived in the country, are occasionally found imbedded in several of the superficial or modern strata, in company with the relics belonging to the yet indigenous species. Along with both of these, also occur the relics of several species, concerning which the voice of tradition is silent. Interred, however, in the same grave with the relics of individuals belonging to existing species, and such as have perished by human agency, and belonging to tribes which at all times have been the objects of the huntsman's pursuit; the author has referred their destruction to *the influence of the chase*, and has exhibited his views on this subject in a paper in the 22d number of the Edinburgh Philosophical Journal, entitled "*Remarks illustrative of the Influence of Society on the Distribution of British Animals.*" Other observers, undervaluing the cause of extinction here assigned, have imagined, that the species referred to were destroyed by the agency of a violent Deluge, which they consider as identical with the one recorded by Moses. How this deluge could select a few species only as the objects of its vengeance, and leave in safety many species living in the same regions, and possessing nearly the same habits, is a difficulty which the abettors of the hypothesis have not yet ventured to explain. Should they attempt to account for the safety of the existing races, by supposing that they were preserved in the Ark, they have still to find proof of the law of exclusion, under the operation of which the now extinct kinds were denied protection. The extravagant pretensions of this hypothesis have been pointed out by the author, in a paper inserted in the 28th number of the Edinburgh Philosophical Journal, entitled "*The Geological Deluge, as interpreted by Baron Cuvier and Professor Buckland, inconsistent with the Testimony of Moses, and the Phenomena of Nature.*"

Among the extinct animals there are multitudes of species, the relics of which do not occur in the superficial strata, and are never associated with the remains of the extirpated or existing kinds. These are found imbedded in solid rock, and seem to have occupied the surface of the earth, when its physical condition and animal and vegetable productions differed greatly from the present order of things. By attending to the specific marks of these remains, the manner in which they are associated, and the strata in which they are imbedded, it is easy to discover that they do not all possess claims to the same degree of antiquity, and that they may be distributed into certain well marked *Zoological Epochs*. In the arrangement of the strata, inclosing these organic remains, there is a definite order of superposition, and there are characters likewise marking groups of different degrees of antiquity. Hence has arisen the idea of Geological Epochs, first distinctly intimated by Lister and Stenon, and elucidated by a host of subsequent observers.

These two kinds of epochs coincide, and thus directly intimate, that the revolutions which have taken place in the animal kingdom, have been produced by the changes which accompanied the successive depositions of the strata. The value of these remarks will be better understood by the following tabular view of the Geological Epochs.

PRINCIPAL EPOCHS.	PRIMARY DIVISIONS.	CHARACTERISTIC DEPOSITIONS.
I. Modern Epoch.	1. Detritus,	Soil. Sand-drift. Peat.
	2. Silt,	a. Lacustrine Silt. aa. Marine Silt.
	3. Diluvium,	a. Lacustrine Diluvium. aa. Marine Diluvium.
	4. Ice,	Polar Ice. Glaciers. Winter Ice.
	5. Spring Deposits,	Sinter. Marl. Iron-Ore.
	6. Volcanic Deposits,	Lava. Ashes.
	7. Meteorolites,	
II. Penult Epoch.	1. Upper Lacustrine Formation,	Argillaceous Marl. Friable Sandstone.
	2. Upper Marine Formation,	——— ——— ———
	3. Middle Lacustrine Formation,	Argillaceous Marl. Gypsum. Sandstone.
	4. Lower Marine Formation,	London Clay. Clay. Marl. Sandstone.
	5. Lower Lacustrine Formation,	Plastic Clay. Lignite. Sandstone.
III. Cretaceous Epoch.	1. Upper Marine Formation,	Chalk. Grey Marl. Green Sand.
	2. Lacustrine Formation,	Argillaceous Ironstone. Limestone. Sandstone. Lignite.
	3. Lower Marine Formation,	Upper. Middle, and Lower Oolites. Lias.
IV. Saliferous Epoch.	1. Variegated Sandstone,	Red Marl. Gypsum. Rock-Salt.
	2. Magnesian Limestone,	Arenaceous Limestone. Calcareous Conglomerate.
V. Carboniferous Epoch.	1. Coal,	Bituminous Shale. Coal. Grey Limestone. Grey Sandstone. Clay Ironstone.
	2. Red Sandstone,	Sandstone-Conglomerate. Red Sandstone. Red Limestone. Porphyry.
	3. Grey Wacke,	Grey Wacke. Alum-Slate. Limestone.
VI. Primitive Epoch.	1. Slate,	Mica Slate. Clay Slate. Chlorite Slate. Graphite.
	2. Granite,	Gneiss. Hornblende Slate. Serpentine. Sienite. Quartz.

VI. *Primitive Epoch.*—The strata of this group support all the others, and appear therefore to be of antecedent formation. They do not contain any organic remains, and have been considered as formed prior to the existence of animals and vegetables on the earth.

V. *Carboniferous Epoch.*—During this æra, in which appear many marine and fresh-water deposits, the earth seems to have been peopled with a variety of animals and vegetables, of genera similar to those of the subsequent epochs. There are some genera, however, which seem to be peculiar to this æra, as *Orthocera.*

IV. *Saliferous Epoch.*—There are few organic remains connected with this æra, and no genera peculiar to it.

III. *Cretaceous Epoch.*—This era is characterised by the absence of the *Producti*, shells which abound in the carboniferous, and even occur, though sparingly, in the saliferous epoch; and by the presence of the remains of the *Paddled Reptiles* and *Belemnites*, which do not exist in the strata of any anterior or subsequent epoch. Here the display commences of Ammonites, Crustacea, and the carnivorous canaliculated molluscous animals; and here, for the first time, are exhibited proofs of the existence on the earth of insects, reptiles, birds, and even quadrupeds.

II. *Penultimate Epoch.*—In this group there are several genera of quadrupeds peculiar to it, as the *Palæotherium* and *Anoplotherium*, in forms, however, approximating to such as occur in the following group, and paving the way for the last and noblest creation, over which Man was destined to bear the sway.

I. *Modern Epoch.*—This era, in a zoological point of view, embraces Man, the existing races of animals and vegetables, and the few species now extinct, as the Mammoth and Mastodon, of which there is proof that they once were the cotemporaries of the yet indigenous species.

It may be supposed, by some, that the preceding statements are at variance with the generally received interpretation of the account of the Creation, as given by Moses. Four successive creations and extinctions of animals and vegetables are here represented as having taken place previous to the existing order of things, and it is assumed that the present races of animals and vegetables, the companions of Man, did not exist on the globe during any of the antecedent epochs. But the most sincere friend of Revelation need be under no alarm, even should he be anxious to establish the authority of his Bible over a wider field than the Moral History of our race. If the Sacred Historian be considered as referring to the earlier æras in the commencement of his narrative only, "*In the beginning*, God created the Heaven and the Earth," and to have contemplated, in what follows, the creation of the animals and vegetables of the Modern Epoch, it will be found that the deductions of science and the records of inspiration harmonize,—as the Word and the Works of God must do, if rightly interpreted. The question, indeed, lies within very narrow bounds. Are the Zoological and Geological Epochs established as *true* in science? If those who are qualified to judge shall pronounce in the affirmative, then must every *interpretation* of that brief portion of the sacred page, inconsistent therewith, be rejected as spurious, and the advocates of error consigned to occupy a page in the History of Prejudice, along with the persecutors of Galileo.

There is one bed occurring in England, and fruitful in the remains of animals, denominated *Crag*, the relations of which seem as yet imperfectly understood. By some it is supposed to be identical with the upper marine formation of the Penult Epoch; by others as a newer deposite, but still older than any of the members of the Modern Epoch. Even in the 99th Number of the Mineral Conchology, Mr Sowerby, under the article *Pecten reconditus*, seems to view it as of the same zoological era with the London Clay. Judging from specimens of recent species of shells from the Crag, and the evidence of portions of the bones of the mammoth, an extinct quadruped of the Modern Epoch, having been found associated with the shells, the author is inclined to view it as a *Marine Diluvium* belonging to the present era.

In the enumeration of British Animals contained in this volume, the author has referred to the extinct or fossil species so frequently, as probably to have excited surprise in those accustomed to consult the more modern of the British Faunas. He was led to adopt this course, not for the purpose of filling up the chasms in the fancied laws of continuity, but that the attention of zoologists may be directed to an examination of the extinct races, and that the geologist may connect with his studies a knowledge of the character and distribution of existing species. The evils which have arisen from the want of this union between zoology and geology, are too obvious to require any comment. The neglect of the fossil species first appeared in the writings of Mr PENNANT, who took no notice of the numerous fossil species of shells and *echinodermata*, which, before the commencement of his labours, had been satisfactorily established. LISTER (to whom we owe the discovery that organic remains are distributed according to a plan, and that certain rocks may be characterised by their imbedded fossils, or that the distribution of organic remains, like the order of superposition of the strata, is regulated by fixed laws) perceived the importance of connecting a knowledge of the characters of the existing and fossil species, and exhibited the union in his Historia Animalium Angliæ. Under the protection of such authority, the author of this treatise is fearless of censure. He even confidently believes, that if the example of LISTER had been followed by succeeding contributors to the British Fauna, geology would have presented at this day an aspect of far greater maturity and interest. Even the characters of the fossil species of plants attracted the attention of the early observers, and led DA COSTA to "recommend to the curious in botany, to take notice of them as an *Appendix Plantarum adhuc incognitarum*," (Phil. Trans. 50, 231.) But this advice has not been followed; for the student may search in vain the published *Introductions* to Botany, or the various *Floras* which have appeared, and fail to meet with even a hint to inform him that the various strata afford remains of extinct species of plants.

In reference to Fossil Shells, the author has chiefly quoted the specific characters given in the *Mineral Conchology* of Mr SOWERBY. This work is of great value in the facilities which it affords for identifying relics of this kind. It is probable, however, that many of those shells now reputed species, will be found to be only varieties, by those who have it in their power to compare specimens from the same localities in different stages of growth. Perhaps not a few corrections are still necessary in regard to the physical distribution of the species.

In quoting the various works in which have been illustrated the characters of the recent species, a reference has been made to those editions which represent the latest improvements of the authors. Thus the 12th edition of the *Systema Naturæ* of LINNÆUS is referred to, instead of the compilation by GMELIN, which not unfrequently supplies its place. A similar plan has been followed with the writings of PENNANT, PULTENEY, and others. By pursuing this plan, the author has avoided the somewhat awkward custom of quoting the authority of LINNÆUS and others for the names of species established subsequent to their decease. The works which are referred to have likewise been quoted in a chronological order, for the purpose of pointing out the priority of the claims of the different observers, and the grounds of the preference given to particular generic or specific names.

Though the author has undergone a very great degree of labour in the construction of the present work, he has much reason to fear that it will be found imperfect even in reference to *published* species. It would give him sincere pleasure to have either his mistakes or omissions pointed out, nor will he conceal his anxiety to obtain information respecting the discovery of new species. The great extent and variety of those publications in which the discoveries of observers may be recorded, forbid any compiler, however industrious, to fancy that he has collected all the scattered documents of the science. The author, however, has done his best, situate as he is at a great distance from personal intercourse with zoologists, and opportunities of consulting the journals of the day, and in a great measure confined to an examination of those works which constitute his own limited library. He is aware that, by employing the common practice of copying synonimes, he might have concealed these imperfections. He has made a different choice, and quoted only the works which he has consulted; except in a few instances, where it appeared requisite to refer to certain authors whose works he has not seen, but in such circumstances the reference is enclosed by ( ), and precedes the title of the work whence it was extracted, so as to leave no risk of mistake.

While the author, as a compiler, has cause to lament the inabilities under which he has laboured, he trusts to be forgiven, if he ventures, as a compensation for acknowledged defects, to prefer some claims on the confidence of the reader. He has received many valuable contributions from kind friends, whose favours he trusts he has not been reluctant to acknowledge. He has long been a practical observer of British Animals, or what a friend of the Honourable DAINES BARRINGTON used to term an Out-door Naturalist. This circumstance has enabled him to correct the specific characters of several animals, and to point out with greater accuracy their habits and distribution, to suppress several spurious species, and to give to the synonimes, in many cases, a greater degree of precision. He trusts the *additions* to the British Fauna which he has here contributed will not at the same time be overlooked.

In the description of species, the author has seldom indulged in physiological details or delineations of instinct. He refers to his Philosophy of Zoology, to which the present work is destined to serve as an adjunct, for ample illustrations on these subjects. To the same quarter he must direct the reader who wishes to comprehend more fully the principles of the *Dichotomous Method*, which he has followed throughout. He is aware that the *Quinary and Circular Disposition of Animals* proposed by Mr MACLEAY, has several followers. This novel method, however, seems to have originated in metaphysical prejudices, and by overlooking the fact, that, in the various organs and their numerous modifications, belonging to each species, there are characters which enable the physiologist to trace resemblances in structure and function with the organs of many other species: So that the same animal may occupy a place in many different physiological groups, and yield the most convenient facilities to those who intend to arrange the species according to any preconceived plan.

It is still the author's intention to proceed farther in the execution of the task which he has undertaken, and to communicate to the public a description of the remaining tribes of British Animals. In the mean time, he trusts that the present work, with all its imperfections, will increase the facilities of the student of British Zoology, and probably be the means of exciting those who are in possession of more accurate information to reveal their success to the public. Recollecting the difficulties which occurred to himself in the discrimination of species, the author has, in the course of his work, studied simplicity, precision, and brevity, that he might contribute to remove obstacles to an acquaintance with a science which has long yielded him gratifying instruction and amusement, and presented so frequently to his notice the brightest exhibitions of the wisdom of his MAKER.

MANSE OF FLISK,
27th December 1827.

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BRITISH ANIMALS.

I.
VERTEBRAL ANIMALS.

Furnished with a Skull and Vertebral Column for the protection of the Brain and Spinal Marrow.

II.
INVERTEBRAL ANIMALS.

Destitute of a Skull and Vertebral Column for the protection of the Brain and Spinal Marrow.

VERTEBRAL ANIMALS.

I. *WARM-BLOODED VERTEBRAL ANIMALS.*

The temperature of the body independent of the surrounding medium. Ribs and sternum for the protection of the viscera. The Brain occupies the whole cavity of the skull. Passage of the nose communicates with the windpipe. Heart double, and the circulation complete.

Class I. MAMMALIA.	Young suckled by the mother. Ovarium double. Covering of hair.
Class II. BIRDS.......	Young supported by food collected by the mother. Ovarium single. Covering of feathers.

II. *COLD-BLOODED VERTEBRAL ANIMALS.*

Temperature of the body under the influence of the surrounding medium. Skin destitute of hair or feathers. The brain does not occupy the whole cavity of the skull. Circulating system imperfect.

Class I. REPTILES.	Furnished with a systemic heart. In general breathe air in their perfect state.
Class II. FISHES....	Destitute of a systemic heart. Furnished with gills. Reside in water.

MAMMALIA.

- ORDER I. PEDATA.—Posterior extremities developed, and attached to a pelvis. Skin with hair. Sleep and bring forth their young on land.
  - TRIBE I. UNGUICULATA.—Fingered Quadrupeds. The four extremities terminating in fingers, furnished with nails or claws, and adapted more or less for seizing objects. All the British species have incisors in one or both jaws.
    - SECT. I. SARCOPHAGA.—*Furnished with Tusks*
      - I. CHEIROPTERA.—Furnished with wings, formed by a naked expansion of the skin, uniting the anterior and posterior extremities.
      - II. FERA.—Destitute of wings. The teeth are pointed, lock into each other, and are capable of chewing the soft parts, or bruising the hard parts of the food employed.
        - I. *Hind Legs developed for walking. The toes separate.*
          - I. PLANTIGRADA.—Walk on the soles of the feet, which are bare. Five toes.
          - II. DIGITIGRADA.—Walk on the extremities of the toes.
        - II. *Hind Legs short, much enveloped by the skin. Fingers and toes webbed, and adapted for swimming.*
          - PALMATA.
    - SECT. II. GLIRES.—*Destitute of Tusks.*
  - TRIBE II. UNGULATA.—Hoofed Quadrupeds. The extremities fitted exclusively to support or move the body. No clavicles. Herbivorous.
    - I. PECORA.—Each foot consists of two toes, covered with strong hoofs. No incisors in the upper jaw in the British species. Ruminate, and have four stomachs.
    - II. BELLUÆ.—Do not ruminate.
- ORDER II. APODA.—Hind feet united with the tail, in the form of a horizontal fin. Skin nearly destitute of hair. Sleep and bring forth their young in the water.
  - I. HERBIVORA.—Nostrils terminating in the snout. Pectoral teats.
  - II. CETACEA.—Nostrils opening on the crown of the head.

1. CHEIROPTERA. BATS.

THE animals of this group feed on insects, chiefly moths, which they hunt in the evening. They sleep during the day. Migrate or become torpid during the winter. Bring forth two at a birth. In the British species, there is only one bony joint in the fore finger, without nails, and two in the rest. The tail is included in the interfemoral membrane; and the summits of the grinders have conical points. All the species of the following groups belong to the genus *Vespertilio* of Linnæus.

A. *Nostrils with appendages. Ears simple.*

GEN. I. **RHINOLOPHUS.** HORSE-SHOE BAT.—Nostrils with a complicated membrane like a horse shoe.—This membrane is divided into two processes, the posterior of which is erect. Ears free, acute and reflected. Two incisors above, in a cartilaginous intermaxillary bone, and four below, approximate, trifid. Tusks 8, grinders 20. Two pectoral and two inguinal teats were observed by Montagu.

1. R. *Ferrum-equinum*. Larger Horse-shoe Bat.—Front grinder in the upper jaw small, simple, and truncated.

Horse-shoe Bat, *Penn.* Brit. Zool. i. p. 147. tab. xiv.—*Mont.* Linn. Trans. ix. p. 165. tab. xviii. f. 5, 6.—Frequenting saltpetre houses at Dartford in Kent, *Latham;* caverns, Torquay, Devonshire, *Montagu.*

The colour is pale rufous-brown; weight about 4 drams; length to the root of the tail 2½ inches; tail 3¾ inches; expansion of the wings 14½ inches. The tusks are simple.

2. R. *Hipposideros*. Lesser Horse-shoe Bat.—Front grinder in the upper jaw acute, and notched at the base before and behind.

Vesp. minutus, *Mont.* Linn. Trans. ix. p. 163. tab. xviii. f. 7, 8.—Rh. hip. *Leach*, Zool. Misc. iii. p. 2. tab. 121.—In caverns with the preceding, Wiltshire and Devonshire, *Montagu.*

Colour, the same as the preceding; weight from 63 to 80 grains; length to the root of the tail 2 inches; tail ¾ inch; extent of the wings 9½ inches. Tusks in the upper jaw notched in front, in the lower simple. Incisors in the upper jaw concealed.—According to Dr Leach, " it is a very cautious animal; very easily tamed, but fond of concealing itself. It frequents the higher parts of the caverns in which it occurs, and probably flies higher than the preceding species."

B. *Nostrils destitute of appendages. Ears with an inner auricle.*

GEN. II. VESPERTILIO.—Ears disjoined. Incisors in the lower jaw six, approximate, bifid; in the upper four, in pairs, cylindrical, pointed.

3. V. *murinus*. Common Bat.—Ears the length of the head, oblong, auricles semicordate.

Vesp. a Bat; Flitter-mouse or Rear-mouse, *Merr.* Pin. 172.—*Ray*, Syn. Quad. 243.—*Penn.* Brit. Zool. i. 148.—Inhabits old buildings and caves. Common.

This animal was placed by Merret among the birds, and is still by many thoughtlessly regarded as belonging to that class. Its covering of hair, instead of feathers, the bringing forth its young alive, and suckling them at the two teats placed upon its breast, are characters which, independent of other actions, remove it far from the feathered tribes. According to White (Hist. Selb. 156.), when tamed, so as to take flies out of a person's hand, it brought its wings round before the mouth, hovering and hiding its head in the manner of birds of prey. It rejected the wings of flies. Ate raw meat. Was capable of rising from a floor, and taking wing with ease. It drinks on the wing like swallows, by sipping the surface as it plays over pools and streams.

4. V. *emarginatus*.—Ears the length of the head, oblong, with a notch on the exterior margin.

M. Geoffroy, Ann. du Mus. vol. viii. p. 198. tab. xlvi.—Near Dover, *M. A. Brongniart.* Fife, *Fleming.*

This species was first separated from the preceding, with which it is apt to be confounded, by the author whom we have quoted. It is not uncommon in France. The auricle is subulated.

5. V. *Noctula*. Great Bat.—Ears shorter than the head, triangular, nostrils bilobated, chin with a wart.

Vesp. altivolans, *White's* Selb. i. 130. & 158.—V. auriculatus, *Walker's* Essays, 472.—Great Bat, *Penn.* Br. Zool. i. 146. tab. xiii. No. 38. —First observed in England by *White*, and in Scotland by *Walker.*

According to White, this species flies high in the air, from the end of April to end of July. Body to the end of the tail 4½ inches. Extent of wing 14½ inches. Weight 9 drachms. The fur soft, of a bright chesnut colour. Smell offensive. Dr Walker says, " Dentes xxxii numeravimus. *Primores* superiores 4 acuti, distantes: inferiores 4 acuti, contigui. *Laniarii* superiores 6, anticis maximis acutis; inferiores 6, anticis majoribus. *Molares* utrinque 6. *Aures* duplicatæ, capite multo minores. Exterior major, ovata, obtusa. Interior minor, brevior, lanceolata. *Palmæ* palmato-alatæ maximæ, pollice unguiculato. *Plantæ* pentadactylæ, fissæ, digitis pilosis, unguiculatis. *Cauda* geniculata, 6 articulis. *Membrana* juxta caudam, margine ciliato. E latebris volitat circa 20. Aprilis."

Gen. III. PLECOTUS. Ears approximating, and united at their inner edges above the eyes. Auricles semicordate.

6. P. *auritus*. Eared Bat.—Ears nearly the length of the body, blunt.

Penn. Brit. Zool. i. 147. tab. xiii. f. 40.—*Flem.* Phil. Zool. tab. i. f. 1.—Not uncommon in England and Scotland.

In this species, the forehead is covered with hair. The ears, which are depressed when the animal is at rest, have transverse ridges towards the outer edge; and the ridge towards the internal edge is ciliated. The tail extends a short way beyond the membrane. The nostrils have a recess. The incisors above are 4, in pairs, remote, the two middle ones notched, and the two lateral ones subulated. Fur greyish-brown above, ash-coloured below. Length 1¾ inches. Breadth 7 inches.

7. P. *Barbastellus*.—Ears about the length of the head, broad.

Vesper. barb. *Sowerby's* Brit. Mis. tab. v.—*Mont.* Linn. Trans. ix. p. 171. Devonshire, *Montagu*.—At Dartford in Kent, *Mr Peel.*

In this species, the forehead is bald, the fur dark brown, becoming mixed with silvery hairs with age. Length 4 inches; breadth 11 inches. Weight 100 grains. Ears notched and waved on the margin. Montagu states, that "the teeth are numerous in both jaws, and much jagged; in the upper, four cutting teeth, but no canine, and a vacant space between these and the grinders: in the lower jaw six cutting teeth, and four canine or longer teeth, and between these last on each side is a small intermediate one: these longer teeth fall into the vacant space in the upper jaw." In examining the teeth of bats, however, we should bear in mind, that some of these drop out at an early age, and that others, especially the incisors and foremost grinders, are frequently minute, and easily overlooked.

II. FERA.

PLANTIGRADA.

I. *The second incisor on each side in the lower jaw uniformly placed. Summits of the grinders with conical points. Clavicles developed.*

A. *Middle incisors produced, without intermediate small ones, the lateral ones and tusks short.*

Gen. IV. ERINACEUS. Urchin or Hedge-Hog.—Two middle incisors above, cylindrical.

8. E. *europæus*.

This species, widely distributed throughout Europe, is the *Dreanog* of the Welsh, and the *Graineag* of the Gael *. The ears are short, the snout pro-

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[*] In giving the provincial names, *E*, is placed for English; *S*, for Scottish; *W*, for Welch; *G*, for Gaelic; and *N*, for Norse.

duced, and truncated, and the nostrils are narrow. The body is covered above with stiff bristles mixed with hair, and below with hair and no bristles. The length is about 10 inches, the tail 1 inch. It is found chiefly near hedges and thickets of furze, and feeds on snails, slugs, worms, and beetles. It is peculiarly serviceable in gardens, which it will speedily clear of such vermin. It is fond of the roots of the plantain. It soon becomes tame, and will readily devour bread soaked with milk, or pieces of flesh. It seldom breeds in confinement. Its young at birth are blind and naked, concealed in a nest of grass, leaves, and moss, and are from four to five in number. The young are incapable of rolling themselves up, which in maturity they can do with ease when terrified, and then present to a dog or other foe a prickly ball. It becomes torpid during the winter, lodging in a dry nest of leaves. It is sometimes persecuted, faom the foolish belief that it climbs up trees and robs them of their fruit, or sucks cows and hurts their udders. The skin is sometimes fixed on the noses of calves or foals at weaning-time, to prevent them sucking, and to irritate the mother. It has likewise been employed to hackle hemp. In Scotland, the northern limits of its geographical distribution probably do not exceed the Murray Frith.

Gen. V. SOREX. Shrew.—Two middle incisors above, bent and notched at the base. The claws of the British species are white.

9. S. *araneus*. Common Shrew.—Colour blackish-brown.

Mus aran. *Ray*, Syn. Quad. 239.—*E*, Erd Mouse, Hardy Shrew; *S*, Erd Shrew; *W*, Llygoden-goch, Chwistlen, Llyg; *G*, Daullag.—Frequent in old walls and grassy banks. Extends to Orkney.

The length is about 2½ inches; of the tail 1½ inches. The toes are plain on the edges. The tail is cylindrical, dark above, light-coloured beneath, and dark at the tip. They have five young. Formerly, supposed to be injurious to cattle. Numbers of them seem to die by disease in August.

10. S. *fodiens*. Water Shrew.—Colour raven-black, with a small white spot above each eye.

Mus araneus, dorso nigro ventroque albo, *Merr.* Pin. 167.—Water Sh. *Penn.* Brit. Zool. i. 126. tab. xi. No. 33.—S. ciliatus, *Sowerby*, Brit. Misc. tab. xlix.—Water Sh. *Mont.* Linn. Trans. vii. 276.—*Flem.* Wern. Mem. ii. 238.—Burrows in banks near water, and is not uncommon.

This species exceeds the former in size. Length of the body 3 inches; of the tail 2 inches. Weight 3 drachms. The colour on the under side inclines to white. Snout long, and a little depressed. Whiskers long. Eyes small, and concealed by the fur. Ears wide, with a pale tuft on the inside. In the middle of the throat and ventral base of the tail a black spot, with a line of the same colour along the middle of the belly. Tail tapering, covered with very short hair, and nearly white at the tip. Margin of the toes on each side ciliated with white hairs. This species swims and dives with considerable facility. We have seen it actively employed on the surface of the water, catching the Hydrometradæ. Said to bring forth nine young.

B. *Incisors nearly equal. Tusks large.*

Gen. TALPA. Mole. Back covered with hair.—Furnished with a tail. Incisors in the upper jaw six, in the lower eight. No external ears. The sternum is furnished with a mesial crest. Forefeet broad, and formed for digging.

11. T. *europæa.*—The fur of this well known animal is usually black, but it is occasionally found in all the intermediate stages to yellowish-white.

E, Mold-wark; *S*, Muddywort; *W*, Gwadd, Twrch-daear; *G*, Famh, Uir-reathabh.—Not in Orkney or Zètland.

The mole, destined to live chiefly under ground, is furnished with very small eyes. It constructs its galleries or roads three or four inches below the surface, in soil frequented by worms, which are its principal food. The roads are scooped out by the fore paws, and the earth, thus removed, is thrown up, at intervals, by the nose, and forms those unseemly hillocks which are so offensive to the gardener and farmer. Moles usually cast their winter fur in May, before which time they have paired. The hillock in which they bring forth their young is distinguished by its superior size. The nest consists of dry roots or leaves placed on an eminence, in an arched chamber, from which roads diverge in different directions. The young are five in number, and at birth are naked and blind. The individuals of the family generally keep together until the following spring, or breeding season; so that a trap set in one of the principal roads of the colony, will frequently catch the whole seven in succession. They have usually a well frequented path to the water, if a ditch be in the neighbourhood. They swim with ease, and cross rivers, or shift from one island to another. They are most active a little after sunrise, and an hour or two after noon; and before rain in summer and thaw in winter. The fur is used in hat-making.

II. *The second incisor, on each side in the lower jaw, placed behind the others. The three kinds of grinders distinct. Clavicle imperfect.*

GEN. VII. MELES. BADGER.—Incisors six in each jaw. Above, the tusk is followed by one small and two large tearers, to which succeed one chewer followed by a large bruiser. In the lower jaw, the bruiser is small, the chewer large, and there is an additional tearer.—See Phil. Zool. ii. p. 181. tab. i. fig. 2.

12. M. *Taxus.*—Hair rigid, grey above, black beneath; head above white, with a black band on each side from the nose over the eyes to behind the ears.

E, Gay, Pate, Bawson; *S*, Brock; *W*, Pryf-Llwyd, Pryf-pen-frith.—Frequent in thickets, and probably not found to the north of the Caledonian Canal.

The usual length of the badger is about 2½ feet, and of the tail 6 inches. Weight seldom exceeds 30 lb. The ears are small, the tongue smooth, and the nails are long, bent, and grooved beneath. A transverse glandular pouch occurs between the tail and vent. It burrows in the ground, forming several apartments with one common entry. Feeds on frogs, lizards, wild honey, and even roots. In confinement, I have seen it devour greedily crows and rabbits, and likewise eggs, of which it seemed very fond, licking out the contents with its tongue. It is probably a general depredator. Roams about during the night in quest of prey, and in the winter season seldom moves from its den, but remains in a quiescent state. It brings forth five young at a birth. Is easily tamed, indolent and fond of warmth. When attacked, seeks for safety in flight, but, when compelled, fights obstinately, biting hard.

The dressed skin, with the hair on, is used for pistol furniture, and the pendent pouches of the Highland soldiers. The flesh is used as food, and the hind quarters, made into hams, are esteemed little inferior to bacon.

It is sometimes found of a white colour. An opinion formerly prevailed among naturalists, that there are two species of badgers, which they termed the *Sow-badger* and the *Dog-badger*. But, in England, ever since the days of Ray, few have given credit to the existence of the former species. In some districts of Scotland, however, the distinction is still recognised. Thus, in the "Statistical Account," it is said, "There are two species of badger found among the loose rocks of the Campsie Fells, the one somewhat resembling a sow, the other a dog; the first is more arched in the back, and is not so nimble in turning itself;" vol. xv. p. 322. Campsie, Rev. James Lapslie. Again, "We have also two species of the badger;" *ib.* vol. p. 466. Blair-Athol and Strowan, Rev. James Maclagan.

At the conclusion of the British Plantigrada, two species formerly resident in the country deserve to be noticed, both belonging to the genus URSUS.

1. URSUS *Arctos*. Brown Bear.

This animal not only prevailed in this country at the period of the Roman invasion (for Plutarch relates that they were transported to Rome), but maintained its existence in spite of the efforts of the huntsman, to the middle of the 11th century at least. In 1057, a *Gordon* is said to have killed a fierce bear, and as a reward was permitted to carry three bears' *(boars?)* heads in his banners. It was reckoned in Wales as a beast of the chace, equal to the boar or the hare, and many places in that country still retain the name of Penn-arth, or the bear's head; *Penn.* Brit. Zool. i. 78. "In an ancient Gaelic poem ascribed to Ossian, the hero Dermid is said to have been killed by a bear in Beinn Ghiel-binn in Perthshire;" Statistical Account, Kirkmichael, Banffshire, Rev. John Grant, vol. xii. p. 449. Though now banished from this island, it is still to be found in France and Germany.

2. U. *Spelæus*. Cave Bear.

This species, so far as is known, has become extinct, and seems to have been cotemporary with the mammoth. It equalled a horse in size. Its remains occur sparingly in some of the large English caves, which have been the graves of so many of the ancient inhabitants of this island. See *Buckland's* Reliquiæ Diluvianæ, p. 17.

DIGITIGRADA.

I. *Bruising grinders in each jaw.*

CANINADÆ.

Two bruising grinders in each jaw. Furnished with a small cæcum.

GEN. VIII. CANIS. DOG.—Pupil circular, diurnal. Fore feet with five, hind feet with four toes; nails hollowed; tongue smooth; ears large; nose moist, smell acute.

13. C. *familiaris.*—Tail recurved.

W, Ci, *fem.* Gast; *N*, Hund.

The dog has long been the companion of man in a domesticated state, and is the only animal which seems to prefer the company of his master to the individuals of his own species. He fawns at his approach, will fight in his defence, runs before him on the road, but will return or watch when a stranger passes, and looks back for instruction where two ways meet; guards property committed to his charge; assists the sportsman; brings objects in his mouth; fawns when begging; hangs down his tail when afraid ;hates beggars, barks at strangers; licks wounds, and bites the stone thrown at him.

The dog runs sidewise, hardly sweats when warm, lolls out his tongue, and runs into water; turns round several times before lying down; frequently dreams; is easily awakened. Eats carrion and farinaceous vegetables, drinks by lapping, dungs upon stones, urines sidewise, lifting his hind leg, and frequently, when he meets strange dogs; smells at the anus of another; is quarrelsome, and eats greedily. The female, when in season, admits all comers, snarls at them, and they remain inseparable for a time; gestation sixty-three days. Young from four to ten in number, blind for the first ten days, and begin to change their teeth at the fourth month.

Externally, the dog is infested with fleas and ticks, and internally by the tape-worn. Eats grass to make him vomit, and to clear his intestines. Fond of rubbing against putrid substances. Subject to hydrophobia, which is believed by many since the days of Pliny, to be prevented by *worming*, a practice which renders the individual incapable of biting. The *worm* (extracted by this process) " is a tendinous fasciculus of fibres running lengthwise under the tongue, as far as its apex, and lying rather loose in a kind of membranous sheath, without being connected, like a true tendon, to any of the neighbouring muscles;" *Blum.* Comp. Anat. p. 326.

The varieties of the dog which occur in the United Kingdom are numerous, and several of these have been long celebrated for their excellence by Appian, Grotius, Claudian, and others. The following synoptical view, contains the names and characters of the principal races.

1. *Motions regulated by the Sight.*

*

a. *Pastoralis.* Shepherd's Dog, or Colly.—Ears half pricked; tail bushy, recurved; fur black, long, soft, and loose.—Docile and sagacious; the useful companion of the shepherd, and still to be found unmixed in many of the sheep districts of Scotland.

b. *Amphibius.* Newfoundland Dog.—Ears pendent; lips loose; fur long, dense, and waved; docile and sagacious; swims and dives well; not unlike the preceding, but larger, and fonder of the water.—Originally from Newfoundland, where it is used for the draught.

c. *Zetlandicus.*—Ears pointed, pricked; muzzle sharp; fur long, brown; bark shrill and indistinct.—This is the common dog or *hund* in the Zetland Isles, and approaches in character to the Greenland dog.

The preceding races are less mixed than any of the others, and probably make the nearest approach to the primitive stock.

d. *Villaticus.* Cur.—Ears half-pricked; fur short and smooth; tail not bushy, and often very short; stronger than the shepherd's dog; and chiefly used in driving cattle.

* *

e. *Taurinus.* Bull-Dog.—Ears half-pricked; head round; snout short; under jaw projecting; stature low and muscular; courageous, and obstinately retains its hold. Seldom kept but by the idle and profligate for the purpose of fighting.

f. *Mastivus.* Mastiff.—Ears pendant; lips large and loose; stature large, stout; aspect sullen. A trusty guard, very vigilant and bold. The Roman Emperors held the British dogs of this kind in high estimation for combats in the amphitheatre, and, according to Strabo, they were trained by the Gauls for battle.

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g. *Scoticus.* Rough Greyhound, Deer-dog, Ratche, or Scottish Greyhound.—Chest deep, body curved, tail long; snout long and bearded; ears half pricked; fur wiry, waved; stature tall, stout; possessed of great sagacity, strength, and swiftness.—Common in the Highlands.

h. *Hibernicus.* Irish Greyhound, or Wolf-dog.—Chest deep; body curved; tail long; snout long: ears pendant; fur smooth and short; stature large; powerful, yet harmless and indolent. Formerly employed for hunting wolves. Still to be found in Ireland.

i. *Leporarius.* Smooth Greyhound.—Chest deep; body curved; tail long; snout long and narrow; ears half pricked; fur short, thin, smooth, and glossy; stature tall, slender; swifter, but not so hardy or sagacious, as the rough greyhound.

* * * *

k. *Maculatus.* Dalmatian Dog.—Fur white, with numerous regular black spots; possessed of little sagacity, but considered as an elegant companion to a carriage.

2. *Motions regulated by the Smell.*

*

l. *Sanguinarius.* Blood-hound or Sleut-hound.—Ears and lips large and pendent; tail blunt; joints thick; fur brown, with black spots; stature strong; scent acute.—This variety, now extinct, was formerly used in recovering wounded game, and in tracing the footsteps of robbers or stolen cattle. From this stock have sprung the *Harrier*, which is the smallest, and is used in hunting the hare; and the *Beagle*, of a larger size, employed in the fox-chase.

* *

m. *Indicator.* Pointer, or Spanish Pointer.—Head and snout thick; fur short, smooth and glossy; docile, but not active.

n. *Aviarius.* Spaniel or Setter. Head and snout narrow; hair soft, long, waved, and pendant; more impatient, active and hardy than the preceding. The Springer or Cocker seems to be a variety of this kind.

* * *

o. *Terrarius.* Terrier.—Ears erect; legs short, with thick joints; snout bearded; hair long and wiry; jaws strong, bites keenly; docile.—There is a small variety with pendant ears and soft fur; and another termed the Otter Terrier, of a large size, a cross breed with the beagle. This last is docile, sagacious, bold, swims and dives well, and makes a good house-guard.

p. *Vertagus.* Lurcher.—Smaller and less slender than the rough greyhound; hair long, wiry; face hairy; is docile, sagacious, and cunning, and steals upon its prey. It is termed in this country the Russian Pointer (See Foster, Phil. Trans. 1767), and proves a staunch active setting-dog.

* * * *

q. *Aquaticus.* Water-Dog.—Ears pendent; body thickly covered with long curled hair; snout slightly recurved; eyes almost concealed in the fur; scent acute; docile, sagacious, learns readily to carry any thing in its mouth; swims well.

3. *Dwarfs.*

r. *Carolinus.* King Charles's Dog.—Ears long, pendulous; body thickly covered with long waved hair. When the hair is remarkably long, it is called the *Shock-Dog.*

s. *Melitensis.* Comforter.—Hair on the ears and tail long; snappish and noisy.

t. *Chinensis.* Pug.—Head globular; under jaw longest and turned upwards.

These three last varieties are chiefly kept by ladies, and are consequently pampered and caressed.

GEN. IX. VULPES. Fox.—Pupil linear, nocturnal. Tail bushy.

14. V. *vulgaris.* Fur brown, and uniform.

S, Tod; *W*, Llewynog; *G*, Sionnach; Balgaire.

The history of the fox is very similar to that of the dog. It feeds on lambs, poultry and carrion, and will hide the booty it is unable to consume. It lives in furze, brakes or young wood, and when pursued, enters a hole in the earth. In the absence of nobler game, it now ranks as the first beast of the chase. Brings forth its young under ground.

There are three varieties of this native depredator recognised by sportsmen.

a. *Greyhound-Fox.*—This is the *Milgi* of the Welsh. Its tail is long and bushy, with a white tip; it is the largest and boldest; and preys upon sheep or lambs.

b. *Mastif-Fox.*—This is of a dark brown colour, somewhat less, but more strongly made.—Feeds on poultry.

c. *Cur-Fox.*—This is the *Corgi* of Wales, and is probably the *Canis alopex* of Schreber. It is the least, of a reddish-brown colour, with the tip of the tail black.

MUSTELADÆ.

One bruising grinder in the upper jaw. Body about the thickness of the head, long; legs short, with five fingers on each foot. No cæcum.

GEN. X. MUSTELA. WEASEL.—Two tearing grinders in the upper, and three in the lower jaw. Ears middle-sized; tongue rough; fur near the mouth white; pupil horizontal; all the species emit a fetid odour when irritated.

15. M. *vulgaris.* Weasel.—Fur above, yellowish-brown; beneath yellowish-white, with the tail uniform.

Sib. Scot. p. 11.—*Ray*, Quad. p. 195.—*Pen.* Brit. Zool. 1. p. 95.; *E*, Foumart or Fitchet; *S*, Whitred; *W*, Bronwen; *G*, Neas.—Common in old walls.

The length of the body is about 7 inches; the tail 2½ inches, and not bushy. It devours mice and young birds. Brings forth five young.—It sometimes changes to white in winter, and in this state appears to be the M. *nivalis* of Linnæus; Syst. Nat. 1. 69. It is said that weasels were introduced into Zetland by the King's falconer, in revenge, as some of the inhabitants had refused him rabbits for his hawks; Sibbald's Zetland, p. 22.

16. M. *Erminea.* Ermine.—Fur above yellowish-brown; beneath yellowish-white, with a bushy tail, black at the end.

Mustela, *Merr.* Pin. 167.—M. sylvestris, *Sibb.* Scot. 11.—M. candida, *Ray*, Quad. p. 198.—M. Er. *Lin.* Syst. 1. p. 68.—Stoat or Ermine, *Pen.* Br. Zool. 1. p. 89.—*E*, Winter Weasel; *S*, Weasel; *W.* Carlwm.—In summer, haunts woods and hedges, in winter corn-yards and barns.

The length of the body is about 10 inches, of the tail 6 inches. In winter the fur assumes a white colour, and is then highly prized. In this state, however, the black on the tail continues unaltered. It is fond of eggs, pigeons, rats, and putrid meat. I have seen it pursuing a young hare by the scent, tracing the steps with as much accuracy as a harrier. This is supposed by Dr Walker, in his Essays, p. 485., to be the animal considered by the Highlanders as noxious to horses, and which is thus described in the Statistical Account of Kirkmichael, Banffshire, (Rev. John Grant, vol. xii. p. 449): " In these mountains, it is asserted by the country people, that there is a small quadruped which they call *Famh.* In summer mornings it issues from its lurking-places, emitting a kind of glutinous matter fatal to horses, if they happen to eat of the grass upon which it has been deposited. It is somewhat larger than a mole, of a brownish colour, with a large head disproportionate to its body. From this deformed appearance and noxious quality, the word seems to have been transferred to denote a monster, a cruel mischievous person, who, in the Gaelic language is usually called *famh-fhear.*" It is probably the same prejudice to which Sibbald refers, (Scot. Ill. p. 11). " *Lavellan*, animal in Cathanesia frequens, in aquis dulcis degit, capite mustelæ sylvestri simile, ejusdemque coloris bestia est. Habitu bestiis nocet. Remedium autem est, si de aqua bibant, in qua ejus caput coctum sit."

17. M. *Putorius.* Foumart.—Fur blackish-brown, paler below and about the ears, with the tail uniform.

Putorius, *Merr.* Pin. p. 168.—*Sibb.* Scot. 11.—*Ray*, Quad. p. 199.—*Lin.* Syst. 1. 67., Fitchet.—*Pen.* Br. Zool. 1. p. 89.—*E*, Polecat, Fitchew; *W.* Ffwlbard; *G*, Fòclan.—In holes under trees, near rivulets.

Length of the body 17 inches, of the tail 6 inches. It brings forth six young ones at a time. Claws long.—In its burrowing habits it resembles the otter. Most destructive to pigeon-houses, poultry-yards and warrens; killing and sucking the blood of numbers of the inhabitants.

The Ferret, M. *Furo*, is merely an albino of this species. It has white fur and red eyes. It breeds freely with the dark individuals.

GEN. XI. MARTES. MARTIN.—Three tearing grinders in the upper jaw, the front one falling with age; four in the lower jaw. Ears middle-sized; tongue smooth; smell musky.

18. M. *fagorum.* Common Martin.—Throat and breast white.

Martes,—Mem. Pin. p. 167.—*Sibb.* Scot. p. 11.—M. fag. *Ray*, Quad. p. 200.—Mustela martes, var. fag. *Lin.* Syst. 1. 87.—Martin, *Pen.* Zool. 1. 92. tab. vi. f. 15.—La Fouine, *Cuvier*, Reg. An. 1. p. 149.—*E*, Martin or Martlet; *W*, Bela Graig.—In woods and rocks in the south of Scotland and England.

The length of the body is about 18 inches, the tail 10. The general colour of the fur is dark brown, the head having a reddish tinge.—It is a great destroyer of poultry and game. Easily tamed. Lodges frequently in hollows of trees, and brings forth from four to six young.

19. M. *abietum.* Pine-Martin.—Throat and breast yellow.

Martes, var. *Sibb.* Scot. p. 11.—M. abietum, *Ray*, Quad. p. 200.—Mustela martes, var. abietum, *Lin.* Syst. 1. p. 67.—Pine-Martin, *Pen.* Br. Zool. 1. p. 94.—*S*, Mertrick; *W*, Belagoed; *G*, Taghan.—In the wooded districts of Wales and Scotland.

This species is somewhat less than the preceding; the colour of the fur is darker, and it is softer to the touch. It builds its nest on the tops of trees, and prefers wild situations, while the common sort approaches houses. The fur of this species, before the Union, formed a lucrative article of export from Scotland. The characters of these two species are ill defined. Dr Walker, in his Mam. Scot. p. 483., seems to consider the yellow colour of the breast as the mark of age.

III. *No bruising grinder in the lower jaw.*

GEN. XII. FELIS. CAT.—Two tearing grinders in both jaws.—Toes, five before, and four behind; nails retractile.

20. F. *Catus*, var. *sylvestris*. Wild Cat.—Tail cylindrical, truncated.

F. sylv. *Merr.* Pin. 169.—*Sibb.* Scot. 13.—*W*, Cathgoed; *G*, Cat-fiadhaich.—In mountainous and wooded districts.

Length from the point of the nose to the base of the tail, 2 feet 4 inches, length of the tail 1 foot 5 inches, girth of the thickest part of the body, 1 foot 8 inches, height, 1 foot 3 inches; weight about 12 pounds. The fur is yellowish-grey; back, sides, and tail, transversely barred with black.

The wild cat lodges in old woods, or in holes in inaccessible precipices, in the less cultivated districts of the country. It preys upon poultry, lambs and kids. When irritated or wounded, it offers dangerous resistance to the sportsman, and on this account has been termed the *British Tiger.* It was formerly reckoned among the beasts of the chase. The fur was used to line robes.

It is generally believed by naturalists, that the wild cat is the parent stock of the *Felis Catus*, var. *domesticus*, or common house-cat. Several circumstances seem to be at variance with this supposition. 1. The tail of the domestic cat tapers to a point, while in the wild cat it terminates abruptly. The head, too, is larger in proportion to the body. 2. The size is much smaller, a character at variance with the ordinary effects of domestication, though probably resulting in part from a poor animal or vegetable diet. 3. It would appear from the Leges Wallicæ, that, about the beginning of the tenth century, the domestic cat was highly prized; for, among the laws of Howeldda, relating to the prices of animals, the price of a kitten, before it could see, was fixed at a penny; till it caught a mouse, twopence; when it commenced mouser, fourpence. Had the cats alluded to been natives of these islands, it is not likely that so high a value would have been attached to them, especially if we take into consideration the ease with which they are reared, and the rapidity with which they multiply. The spotted variety, termed the Cypress Cat, is noticed by Merret, who says, (Pin. 169.), "Enutritur in ædibus nobilium." The domestic cat is probably derived from Asia, and may be regarded as one of the few of our useful naturalised quadrupeds. Its period of gestation is sixty-three days.

* * *

Extensive revolutions appear to have taken place among the British Digitigrada, occasioning the extirpation and extinction of several species.

1. *Canis Lupus.* Wolf.

This species became extinct in Scotland in 1680, the last having fallen, it is said, by the hands of Sir Ewen Cameron of Locheil. They continued in Ireland, so late as 1710. King Edgar is said to have reduced their numbers greatly, by commuting certain punishments for a given number of wolves' tongues. Succeeding princes had recourse to various expedients to restrain their increase. The progress of civilisation at length effected their destruction. Among our Saxon ancestors, January was called the *Wolf-month*, as at that season they were particularly destructive. An outlaw was said to be wolf-shed. Independent of the voice of tradition or history, the remains of this animal in limestone caves, attest its former residence in this country.

2. *Extinct Hyæna.*

This species, not now known alive on the globe, and which appears to have been of the size of the brown bear, nearly resembles in its osteology the Cape Hyæna. Plate 3d of Buckland's Rel. Dil., exhibits a comparative view of the teeth of the two species. The remains of this animal have occurred in caves at Kirkdale and Plymouth, and in alluvial clay at Lawford, near Rugby, in Warwickshire. The learned Professor, in the above work, infers, from the number of bones of other animals occurring in sharp fragments, with the marks of the hyæna's teeth upon them, along with the excrement of that animal, that the Kirkdale Cave had long been occupied as a hyæna's den, and that this species possessed the habit of carrying into caves the remains of its prey.

3. *Extinct Tiger.*

Remains of this animal have occurred in the caves of Kirkdale and Plymouth. They equal, if not exceed in size similar bones belonging to the Bengal Tiger. Buck. Rel. Dil. p. 17–72. Plate vi. f. 5, 6, 7. The two last extinct species, it may be added, occur in similar circumstances, in many places on the Continent of Europe*.

PALMATA.

1. *Incisors and Tusks in both jaws.*

GEN. XIV. LUTRA. OTTER.—With the three kinds of grinders, and six incisors in each jaw.

21. L. *vulgaris*. Common Otter.—Fur blackish-brown, with a white spot on each side of the nose, and another under the chin.

Lutra, *Merr.* Pin. p. 167.—*Sibb.* Scot. p. 10.—*Ray*, Quad. p. 187.—Mustela Lutra, *Lin.* Syst. 1. p. 66.—*Pen.* Br. Zool. 1. p. 92. tab. viii. No. 19. —*W*, Dyfrgi; *G*, Doran, Dorchie.—Not uncommon. Near lakes and rivulets.

The usual length of the body of the otter is about 2 feet, and the tail 16 inches. The ears are minute: the nostrils furnished with a valve for closing them when diving; eyes small, with a dorsal aspect and lateral eyelid; feet with five toes, and strong grooved nails; tongue smooth.—In the female, the external organ of generation is a small pouch, in which is the entrance to the vagina. It burrows in the banks of rivulets, and brings forth five young. In Zetland (where it is called *Tyke*), the otter frequents the sea-shore. In winter, its footsteps are traced in the snow to the springs of fresh-water which it visits.—The fur of the otter is valuable, and forms an article of export in the northern isles. The animal, when taken young, is easily tamed, is docile, grateful, and will catch fish for its master.

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* On the subject of the extinct quadrupeds of Britain; see a paper which I published in the Edin. Phil. Journ. vol. ix. p. 287., "Remarks illustrative of the influence of Society on the Distribution of British Animals."

GEN. XV. PHOCA. SEAL.—All the grinders nearly uniform in their appearance; six incisors above, and four below. Fur short. Fore-legs short, and inclosed in the skin; hind-legs nearly coalesce with the body; pelvis narrow. Sleeps on stones; breeds in caves; is easily killed by a blow on the nose. Might be domesticated with advantage. Yields oil.—The skin is made into leather.

21. P. *vitulina.* Common seal.—Body about six feet in length; colour various.

Vitulus mar. *Merr.* Pin. 167.—*Sib.* Scot. p. 10.—Phoca, *Ray*, Quad. 189. *Lin.* Syst. 1. p. 56. 1.—*Pen.* Brit. Zool. 1. 137.—*Flem.* Phil. Zool. tab. 1. f. 3. *E*, Sea-calf, Soil; *S*, Selch, Pouart, Cowie, Tangfish; *W*, Moelrhon; *G*, Ron.—On all our shores and large estuaries.

Seals are extremely watchful, and seldom remain long without raising their heads and looking around. They are expert divers, and can seldom be shot in the water. They prey on fish of all kinds, and in the estuaries are most destructive to salmon. They display considerable ingenuity in evading being captured by the net, into which they occasionally enter in search of their prey, creeping out at the bottom, or leaping over it at the surface. They sometimes enter fresh-water lakes in pursuit of their prey. In the Statistical Account (vol. vi. p. 260.) of the parish of North Knapdale, by the Rev. Archibald Campbell, it is said, that Lochow, which is about twenty miles in length, and three in breadth, "abounds with plenty of the finest salmon; and, what is uncommon, the seal comes up from the ocean, through a very rapid river, in quest of this fish, and retires to the sea at the approach of winter." They breed about midsummer, bringing forth their young, which are two in number, in caves on the coast. Seals were formerly used as food, though their flesh is dark coloured. At present they are sought after on account of their skin, and the oil which they yield. A few of the young ones are slain in the caves in which they were brought forth. The old ones are shot when at rest on sand-banks, or rocks, or taken in nets. Sometimes they are destroyed by recurved iron pikes, secured in beams of wood fixed on the banks, which they frequent, near low water-mark; the seals, at a proper time of tide, are surprised, and driven rapidly into the water, when they are interrupted and wounded by the pikes, and felled with clubs. According to Dean Monroe, seals, when on the banks at Lochegrenord, in Islay, were slain with trained dogs. They are easily tamed. They are occasionally subject to epizooty. About fifty years ago, multitudes of carcases were cast ashore in every bay in the north of Scotland, Orkney and Zetland, and numbers were found at sea in a sickly state.

Mr Pennant mentions one taken near Chester in May 1766, which, at the time, was nearly naked; only the head and a small spot beneath each fore-leg being hairy, Brit. Zool. i. p. 139. In the last edition of the same work (1812), this var. is described as a distinct species, *Pied Seal*, with the nose tapered and elongated; the fore-head black; the hind-head and throat white, with a spot beneath each fore-leg of the same colour; hind-feet dirty white; remainder an intense black; i. p. 177.

The relics of the seal have been found in the marine diluvium which occurs on the banks of the Forth towards the head of the estuary.

22. P. *barbata*. Great Seal.—Length about 12 feet; fur consisting of thin brown hairs.

Haaf-fish, Bull-fish, *Pen.* Brit. Zool. 1. p. 136.—On the shores of the Hebrides and northern islands.

The history of this species as a British subject is very imperfect. Pennant did not meet with it during his voyage. The Rev. Donald Maclean, in his account of the Parish of Small Isles, Stat. Ac. vol. xvii. p. 275., mentions the great seal as a distinct species, and states, that, while the common kind bring forth their young in the middle of summer, this species does so about the middle of harvest. Dr Edmonston, in his "View of the Zetland Islands," ii. p. 294., says, "That the head is longer in proportion to the body than in the common seal; that they live in pairs only, and in exposed situations." In the article Greenland, in the Edin. Encyc., by Sir Charles Giesecké, it is stated, that the flesh of this species is white and very good. The "Great Seal" of the British Museum (Phil. Trans. xlii. p. 383. tab. i.), seems to be an aged individual of the common species. In the Appendix, No. 4., to "Ross's Voyage of Discovery to Baffin's Bay," there is a description of this species, which we shall here insert, as furnishing a standard of comparison in the examination of our native kind.

"Its length, from the tip of the nose to the extremity of the tail, was 8 feet; its circumference, behind the fore-flippers, 5 feet 7 inches; weight, 830 pounds. "Fore-flippers measured in length 11 inches, in breadth 6 inches. Hind-flippers, in length 16 inches, in breadth 2 feet; when expanded. The claws of the former were black, horny, and curved; those of the latter were long and straight. Fingers five, middle ones longest in fore-flippers. The body covered with thick, coarse, short, dark grey hair. The eyes about the size of an ox's, furnished with a nictitant membrane, irides dark hazel; the pupil elliptic, perpendicular. No external ears; the auricular apertures placed about 2 inches behind the eyes. The upper lip broad, rounded, fleshy, divided into two lobes by a deep sulcus, division, which is black and naked; each lobe is provided with eight rows of strong white bristles, semipellucid, and curled at the ends; the lower less thin and pointed. Tongue thick, pointed and cleft; upper surface papillous. Teeth, upper front six, truncate, small; tusks solitary, truncate; grinders three, the anterior one solitary; lower front four, imperfectly developed; tusks small and obtuse; grinders seven, the two posterior imperfectly lobed, the rest being small long tuberosities, scarcely produced through the gum. The heart about the bulk of that of the ox, its texture strong; the foramen ovale obliterated, (a point on which there is yet some discord among comparative anatomists). The aorta 3 inches in diameter, its coats 2½ lines in thickness; the caliber of the pulmonary artery nearly the same; the thickness of its coats 1 line. Kidneys elliptic, lobes 150 to 160. Stomach filled with a greenish dark fluid; its inner coat lined with ascarides an inch and a half long; they hold on with great tenacity, rendering it difficult to detach them; the small intestines were inhabited thickly with teniæ, from 1 to 5 feet in length. Excrementa of the large intestines resembling thick verdigris paint. Penis about 18 inches long, 8 in circumference; the lobe about 8 inches long, and 3 in circumference; the lower surface depressed for the reception of the urinary canal."

11. *Destitute of incisors or tusks in the lower jaw.*

GEN. XVI. TRICHECHUS. WALRUS.—Tusks of the upper jaw greatly produced, and directed ventrally.

23. T. *Rosmarus*. Tusks remote.

Walrus, *Sibb.* Scot. p. 10., *Macgillivray*, Edin. Phil. Journ. ii. p. 389.—A rare straggler.

This species is noticed both by Boece and Sibbald, without any facts being stated illustrative of the times or places of its occurrence on our shores. In December 1817, however, a solitary individual was shot while lying on a small rock at the Sound of Stockness on the east coast of Harris, which was upwards of 10 feet in length. The tusks measured 8½ inches in length. On the shores of Spitzbergen it measures 15 feet in length, and 10 in circumference, and the tusks are 20 inches in length. It has been conjectured, that the ivory bits which Strabo enumerates in the articles of British commerce, were manufactured from the teeth of this animal. Perhaps the influence of civilization may have so reduced the geographical limits of this species, as now to confine its dwelling to the Arctic Seas. It was formerly captured in abundance in the Norwegian Seas.

GLIRES.

1. *Summits of the grinders with conical processes, covered with enamel.*

Gen. XVII. MUS. Mouse.—Incisors with pointed summits; three grinders in each jaw; destitute of cheek-pouches: hind-legs of moderate length; tail nearly naked, annulated with scales.

a. MICE.

24. M. *Musculus.* *Common Mouse.* Body about 3 inches in length; fur yellowish-brown above, mixed with black hairs; beneath iron-grey.

Merr. Pin. p. 167.—*Sibb.* Scot. p. 12.—*Ray*, Quad. 218.—M. Mus. *Lin.* Syst. 1. 83. *W*, Llygoden; *G*, Luch.—Common in houses.

The mouse is remarkably prolific. We have found seventeen young ones in a nest, all nearly of the same size, and blind. Albinoes occasionally occur, and the variety may be propagated.

25. M. *sylvaticus.* Field-Mouse.—Body about 4¼ inches in length; fur yellowish-brown above, beneath white, the margin of the former colour, and a spot on the breast ferruginous.

Sibb. Scot. p. 12.—M. domesticus medius, *Ray*, Quad. 218.—M. sylvaticus, *Linn.* Syst. 1. p. 84.—*Penn.* Brit. Zool. 1. p. 120.—*W*, Lygoden ganolig. In ploughed fields and gardens, common.

The fur is very like that of the preceding on the back, but the sides incline to rufous; the ears are larger, the head longer, and the eyes more prominent. The weight is about an ounce. The tail is black above, grey beneath, and of the length of the body. This species never frequents houses, but takes up its abode in cultivated fields and gardens, forming its retreat under ground, in which it lays up a store of seeds and roots before winter, and, in cold weather, when the air is about eleven degrees above the freezing point, it becomes torpid. It brings forth about nine young ones at a litter.

26. M. *messorius.* Harvest Mouse.—Length of the body about 2½ inches, of the tail 2 inches; fur chestnut-brown above, white beneath, the colours divided by a straight line.

White's Works, 1. p. 58.—*Penn.* Brit. Zool. 1. p. 121.—*Mont.* Lin. Trans. vii. p. 274. Hampshire, *White.* Wiltshire, *Mont.*—Inhabits corn fields and ricks in England.

The late Mr White of Selborne discovered this species in 1767. From his observations, Mr Pennant appears to have drawn up his description in the Brit. Zool. i. p 121. without acknowledging the source of his information. According to Mr White, " they never enter into houses; are carried into ricks and barns with the sheaves; abound in harvest; and build their nests amidst the straws of the corn above the ground, and sometimes in thistles. They breed as many as eight at a litter, in a little round nest composed of the blades of grass and wheat." In winter they burrow deep in the earth, or lodge in oat ricks. Montagu has found them in the latter situation in the colder months without any signs of torpidity. They are the smallest of British quadrupeds, not exceeding in weight $\frac{1}{8}$th of an ounce.

b. RATS.

27. M. *Rattus*. Black Rat.—Fur greyish-black above, paler coloured beneath; body eight, and the tail nine inches in length.

M. major seu Sorex, *Merr*. Pin. p. 167.—*Sibb*. Scot. p. 12.—*Ray*, Quad. p. 217.—*Penn*. Brit. Zool. ii. p. 113. *W*, Llygoden fferngig; *S*, Roof-rotten.—Infests houses.

This is a voracious animal, living in houses, barns, and granaries, and devouring all sorts of provisions. I have evidence of their bringing forth eleven young ones at a litter, and of their pulling the hair off the necks of cows to line their nests. The remarks of Mr Pennant have led to the supposition that this species is now nearly extirpated by the brown rat, which he considered as its natural enemy. He does not mention his evidence of enmity between the species. On the contrary, I know that they have lived for years under the same roof, the brown rat chiefly residing in holes of the floor, the other chiefly in holes in the roof. The period of their extirpation is far distant. They still infest the older houses of London and Edinburgh, and in many districts of the country they are common.

28. M. *decumanus*. Brown Rat.—Fur yellowish-brown above, beneath grey; body about nine inches, with a tail of equal length.

Penn. Brit. Zool. 1. 115.—M. fossor, *Walker's* Essays, p. 497. *S*, Grund-rotten.

This species is not so nimble as the former, but it is stronger and bolder; the nose is more obtuse, and the hair on the feet thinner. It burrows under the foundations of houses, but prefers being near drains of foul water. It swims with ease, and infests ships and harbours. It brings forth as many as nineteen at a litter. This species is generally believed to have been imported into this country about the middle of the last century, some say from Norway, whence it has been termed Norway rat, others from Antwerp, or from America. It is now, however, more generally considered as of Asiatic origin. Linnæus seems to have confounded this species with the former in the description in his Syst. Nat. p. 83. According to the observations of Mr Wilson, the rats of London are very subject to urinary calculi; Annals of Phil. vol. ix. p. 319.

GEN. XVIII. SCIURUS. SQUIRREL.—Incisors with chisel-shaped summits; grinders four on each side in both jaws; four fingers and five toes.

29. S. *vulgaris*. Common Squirrel.—Fur brownish-red above, beneath white; ears tufted with long hairs; length of the body about 18 inches.

Merr. Pin. p. 168.—*Sibb.* Scot. p. 11.—*Ray*, Quad. 214.—*Linn.* Syst. i. 86.—*Penn.* Brit. Zool. i. 107. *B*, Gwiwair; *G*, Feorag. In old wooded districts.

This lively active animal frequents extensive woods, where it resides on the trees, feeding on buds, twigs, and fruits. It lays up a stock of provision for the winter, securing it in the cleft of an old tree. It forms its nest of moss or dried leaves in a similar situation, in which it brings forth from four to five young. These are easily tamed, but prove destructive to furniture. They sit erect, covering the body with the tail, and using the fore-legs as hands. Destructive to young plantations. Have disappeared from some parts of Argyleshire, where they were formerly abundant; Statist. Account, i. p. 487.

II. *Summits of the grinders flat, with the enamel appearing partially on the surface. Herbivorous.*

GEN. XIX. LEPUS. HARE.—Subsidiary incisors in the upper jaw. The prismatic grinders are six in the upper, and five in the lower jaw on each side. Inside of the cheeks hairy. Five fingers and four toes. Furnished with a tail. Ears large.

30. L. *timidus.* Common Hare.—Ears longer than the head, and black towards the tips. Tail black above, white beneath. Weight from 6 to 12 ℔.

Merr. Pin. 168.—*Sibb.* Scott. p. 11.—*Ray*, Quad. p. 204.—*Penn.* Brit. Zool. i. p. 98. *S*, Maukin or Cuttie; *W*, Ysgyfarnog, Ceinach; *G*, Maigheach.—In cultivated districts. Not in the Northern Isles.

The hare has its form on the ground. It breeds several times in a season, pairing in February; goes with young thirty days, and produces from one to five at a litter. The young have their eyes and ears perfect, the body covered with fur, and the limbs fit for locomotion. Destructive to gardens and young plantations. Flesh highly valued for soup, though of a dark colour. Fur valuable. In Scotland the skins are collected by itinerant dealers, and annually sold in the February market at Dumfries, sometimes to the amount of 30,000.

A black hare was killed lately at Netley, Shropshire, by my respected friend, the Reverend F. W. Hope.

31. L. *cunniculus.* Rabbit.—Ears shorter than the head, dark coloured towards the tips. Tail above nearly of the same colour as the back. Weight from 3 to 5 ℔.

Merr. Pin. p. 168.—*Sibb.* Scot. Ill. p. 11.—*Ray*, Syn. Quad. p. 205.—*Penn.* Brit. Zool. i. p. 104. *E*, Coney; *S*, Kinnen; *B*, Cwningen.

The rabbit is common on the British continent and islands, but would soon be extirpated unless protected in warrens. It breeds six or seven times in the year, and brings forth five to eight at a litter. The eyes and ears, at birth, are imperfect, the skin is destitute of hair, and the limbs unfit for locomotion. Easily domesticated, and in many situations might be reared to advantage. Its flesh is white and delicate, and its fur valuable.—Three varieties occur. The first is the common *Grey Rabbit*, widely dispersed. The second is the *Black Rabbit*, found in several warrens, but nowhere numerous. The third is the *Silky Rabbit*, probably brought originally from Angora. They occur in the May, and a few other islands. They do not associate with the common kind, but live and breed in holes apart. The fur is of a dirty ash-colour above, paler beneath, of a silky fineness, and 3 inches or more in length.

32. L. *variabilis.* Alpine Hare.—Ears shorter than the head, and black towards the tips, the rest of the body dusky in summer, and white in winter.

Barrington, Phil. Trans. 1772. p. 11,—*Penn.* Brit. Zool. i. 102.—*Walker's* Essays, p. 493. *S*, White hare; *G*, Maigheach-gheal.—Inhabiting the Scottish mountains, and rarely descending lower than 1500 feet above the level of the sea.

The Hon. Daines Barrington assigns as the length, in inches, of the fore-legs, from the uppermost joint to the toe, of the hare, 7¾; rabbit, 4½; alpine hare, 6½;—of the hind-legs, in the hare, 11; rabbit, 6¾; alpine hare, 10¾;—the length of the body from the rump to the mouth, in the hare, 22; rabbit, 16½; alpine hare, 22. This last species holds, therefore, an intermediate rank between the hare and the rabbit, in reference to its dimensions. The ears are white behind, and in summer they are brownish before, and in winter grey. The lips are always black. It lurks beneath stones and in holes in precipices. Said to be easily tamed. Breeds a few hundred feet below the summits of the higher mountains. Forster, in his Natural History of the Volga, Phil. Trans. 1768, p. 343., intimates that the fur of this species is greatly inferior to that of the common hare. Dr Leach considers the *L. albus* of Brisson, to which he refers the Scottish hare, to be different from the *L. variabilis* of Pallas (Ross's Voyage, App. No. iv. p. 151., and Annals of Phil. xiv. 201.) The following notices on the change of colour in this species are interesting. "The varying hare becomes white in winter. This remarkable change takes place in the following manner: About the middle of September the grey feet begin to be white, and before the month ends, all the four feet are white, and the ears and muzzle are of a brighter colour. The white colour gradually ascends the legs and thighs, and we observe under the grey hair whitish spots, which continue to increase till the end of October; but still the back continues of a grey colour, while the eye-brows and ears are nearly white. From this period the change of colour advances very rapidly, and by the middle of November the whole fur, with the exception of the tips of the ears, which remain black, is of a shining white. The back becomes white within eight days. During the whole of this remarkable change in the fur, no hair falls from the animal; hence it appears that the hair actually changes its colour, and that there is no renewal of it. The fur retains its white colour until the month of March, or even later, depending on the temperature of the atmosphere, and by the middle of May it has again a grey colour. But the spring change is different from the winter, as the hair is completely shed;" Edin. Phil. Journ. vol. ii. p. 191. The laws regulating the colour of the summer and winter covering of quadrupeds and birds I have given in detail in my "Philosophy of Zoology," vol. ii. p. 15.

Gen. XX. MYOXUS. Dormouse.—No subsidiary incisors. Roots of the grinders with fangs.—Grinders four on each side. Hairy. Destitute of a cæcum.

33. M. *avellanarius.* Common Dormouse.—Fur above tawny red; beneath white; tail bushy.

Mus avellanarum, *Merr.* Pin. p. 167.—*Ray*, Quad. p. 220.—*Linn.* Syst. i. p. 83.—*Penn.* Brit. Zool. i. p. 110.—*Walker's* Essays, p. 499. *E*, Sleeper; *W*, Pathew.—Inhabits woods and hedges. Rare in Scotland.

The dormouse is about the size of the common mouse, but fuller; the tail is about 2½ inches in length, covered thickly with long hair. Eats its food erect. During winter it subsists on the store of nuts which it had prepared in autumn, and in very cold weather it becomes torpid.

GEN. XXI. ARVICOLA. VOLE.—No subsidiary incisors. Roots of the grinders simple; there are three on each side on both jaws. Tail round and hairy, and about half the length of the body.—The species of this genus differ from the true mice, with which the older authors confounded them, by the superior size of the head, the shortness of the tail, and the coarseness of the fur.

34. A. *aquatica*. Water Vole.—Body 7 inches long; tail 3 inches.

Mus aquaticus, *Merr.* Pin. p. 167.—*Sibb.* Scot. p. 12.—Mus amphibius, *Linn.* Syst. i. p. 82.—Water Rat, *Penn.* Brit. Zool. i. p. 118.—Mus amphibius, *Walker's* Essays, p. 496. *W*, Llygoden y dwfr; *G*, Radan uisque.—Frequent in the banks of rivers. Not in the Northern Isles.

The males are greyish-black on the back, the females yellowish-brown, with scattered black hairs, both light coloured beneath. Tail covered with short hair, and ending in a small pencil. This species swims and dives well. It seems to feed exclusively on the roots of aquatic plants, no remains of the bones of little fishes having been detected by us in its excrement, though said to prey on such. During the winter months, it retires to a cavity formed under ground in a dry bank, in which it has previously deposited a stock of provisions. This consists in some cases of potatoes, as was observed by Mr White, (Hist. Selb. i. p. 129.); and we have twice witnessed the same thing. In the end of July we have found the stomach of a young one filled with clover. It is probable that this species becomes torpid in the cold months.

35. A. *agrestis*. Field Vole.—Body 3 inches and a half long, tail 1½ inch.

Mus agrestis, *Ray*, Quad. p. 218.—Short-tailed mouse, *Penn.* Brit. Zool. i. p. 123. *B*, Llygoden gwlla'r maes. Vole-mouse in Orkney.—In gardens and meadows, common.

This species never exceeds half the size of the former. The fur is browner above and paler beneath, the ears are longer in proportion; and the tusks, which in the former are yellow, are in this nearly white. Doubts were entertained by Linnæus whether this and the former were distinct species. But in his description of his *Mus terrestris* (our No. 35.), he introduces several of the characters of the *A. aquatica;* and Pennant seems to have described a young one of that species for the *agrestis*. The field vole is most destructive in gardens to seeds, especially to early peas, which, after germination has commenced, it scents out and digs up. The trap called by gardeners the Fourth Figure catches them readily. It is equally destructive to young plantations, and to coarse pastures. It multiplies prodigiously in certain seasons, and commits extensive ravages.

* * *

In consequence of the progress of Society, one species has been extirpated from the British Glires—the BEAVER *(Castor Fiber)*. This animal appears, from the testimony of Giraldus de Barri, to have existed only in one river in Wales and another in Scotland in the 12th century, (Hist. Camb. lib. ii.

cap. 3.), about which period it probably became extinct, although the credulous Boece states that they were found in plenty so late as the 15th century. It was termed by the Welsh in the 9th century ("Leges Wallicæ," iii. 11. 12.) *Llosdlydan*, and in the Gaelic it is still termed, from tradition, *Losleathen*. See Mr Neill's valuable "Account of some fossil remains of the Beaver found in Perthshire and Berwickshire," Wern. Mem. iii. p. 207. The bones of this species occur in beds of marl under peat-moss, as quoted by Mr Neill; and in Berkshire, Phil. Trans. 1757, p. 112.

The Guinea pig *(Cavia Cobaya)*, has been domesticated in the belief that its smell will expel rats. It is a native of Brazil, and may be regarded as a useless addition to our stock of quadrupeds.

PECORA.

I. *Horns permanent, furnished internally with an osseous core.*

GEN. XXII. BOS. Ox.—Horns lateral at their origin, but afterwards recurved, smooth.

36. B. *Taurus*. Common Ox.—Front flat, longer than broad. Horns proceeding from the extremities of the occipital ridge.

The cow goes with young nine months, and is capable of breeding the second year. Milk teeth begin to shed about the tenth month. Numerous varieties exist at present in a domesticated state, differing in colour and shape, and in the form or absence of their horns. Those in the more fertile districts are the largest; those frequenting mountainous districts with scanty pastures are the smallest, with the fore-quarters proportionally larger, as in Zetland.

Several varieties, if not species, of oxen appear to have occupied the British Island, in a wild state, at no very remote period. Lesley ("De Origine, moribus et rebus gestis Scotorum," Rome 1678) mentions herds of "*Vaccæ non cicures*," (p. 10.), which frequented the mountainous districts of Argyle and Ross. These probably were the parent stock of our domesticated varieties, which, with but little care, are reared in the remoter districts.

The "*boves sylvestres*" of Lesley (p. 19.), which were of a white colour, possessed, as he states, "jubam densam, ac dimissam instar leonis;" while Sir Robert Sibbald says, that, in his day, they did not differ in form from the common kind. The remains, however, of this white breed, with the muzzle and ears black, may be found mixed occasionally in our domestic kind. In a pure state, they are preserved in the parks of a few of the nobility. The remains of oxen, which occur in marl-pits in this country, seem all to belong to the species *taurus*. Many of the skulls, however, exhibit dimensions superior to those of the largest domesticated kinds. A skull in my possession measures 27½ inches in length, 9 inches between the horns, and 11½ inches across at the orbits.

The manes, which several authors state to have characterised the wild oxen of this country, and their remarkable ferocity, probably had a reference to the *Bos Urus*, a species once indigenous, as attested by the occurrence of its remains in the recent strata. A skull of this species, found by Mr Warburton, at Walton in Essex, forms a part of the Collection of the Geological Society of London, and another skull found at Woolwich, exists in the Museum of the Royal College of Surgeons, London. This species differs remarkably from the *Bos Taurus*, in the front being swollen, broader than long, the horns taking their rise lower than the occipital ridge, and the ribs being fourteen in number, instead of twelve. This species has now become scarce on the Continent of Europe, and probably at no distant period will become extinct.

GEN. XXIII. CAPRA. GOAT.—Chin with a beard, and the rough angular horns bent retrally, and approximate at their base.

37. C. *Hircus.*—Horns sharp, edged anteally.

Caper, *Merr.* Pin. p. 166.—Hircus, *Sibb.* Scot. p. 8.—Capra domestica, *Ray*, Quad. p. 77.—C. Hircus, *Linn.* Syst. i. p. 94. *B*, Bwch; *G*, Gaoither.—In the more remote mountainous districts.

This animal, valuable in an economical point of view, is prized for its skin, fur, flesh, and milk. It is most destructive to young plantations, and seems suited to those districts which are too rugged for sheep pasture. It has two teats, and goes with young four months and a half. By some, the steinbock of the Alps *(C. ibex)* is considered as the parent stock of our domestic goat, while others regard it as the Paseng of the mountains of Persia *(C. ægagrus)*.

GEN. XXIV. OVIS. SHEEP.—Chin beardless, the rough angular horns bent retrally, laterally, and anteally, and subremote at their origin.

38. O. *Aries.*—Horns compressed and lunated.

Aries, *Merr.* Pin.—Ovis, *Sibb.* Scot. p. 8.—O. domestica, *Ray*, Quad. p. 73.—O. aries, *Linn.* Syst. i. p. 97. *W*, Hwrd.

The sheep goes with young 150 days, and generally produces one, sometimes two or more, at a birth. During the first year, the young have eight sharp, cutting teeth. In the second year the two middle ones drop out, and have their places supplied by two permanent teeth, broader and more obtuse. In the third, fourth, and fifth years, the remaining pairs of the milk-teeth are shed, and the permanent ones, by which they are replaced, are proportionally broad and blunt. In the eighth year the teeth begin to drop out, the two middle incisors first, and two are shed in each of the three following seasons. The wool differs, among individuals, in colour, fineness, and length; and is in so great demand for our manufactures, that innumerable attempts have been made to establish particular breeds. Hence our short or long woolled kinds, coarse and fine woolled kinds. Of the more ancient breeds, two seem entitled to particular notice, viz.

Mugg Sheep.—In this variety the face and legs are white, or rarely spotted with yellow, with the forehead covered with long wool. This is the native breed in Scotland, to the north of the Forth and Clyde. They are of a small size, and seldom weigh above 8 or 10 lb. per quarter. Some tribes have horns, others are destitute of them, and they vary in the length of the tail. They may be considered as the stock of the numerous modern and valuable varieties which are bred in the best cultivated districts. The *Shetland sheep* belongs to this kind. The fur consists of fine wool next the skin, with long coarse hairs,—indications of an inhabitant of an arctic climate. The wool is never shorn, but when about to be shed in summer it is torn from the body by the hand,—a process termed *rowing.*

Black-faced Sheep.—The face and legs are black, and the tail short. Usually furnished with large horns. This species abounds in the mountainous districts of the south of Scotland.

II. *Horns simple and deciduous.*

GEN. XXV. CERVUS. DEER.—Horns, when growing, covered by a soft velvety skin, which ultimately dries up, and is rubbed off.

39. C. *Elaphus.* Stag or Red-Deer.—Horns branched, round, and recurved.

Cervus, *Merr.* Pin. p. 166.—*Sibb.* Scot. p. 9.—*Ray*, Quad. p. 84. C. El. —*Lin.* Syst. 1. p. 93.—*W*, Carw; *G*, Fiadh.

The stag is about 3½ feet in height. In the Duke of Athol's grounds some have been shot, which weighed upwards of 18 stones (Stat. Ac. xx. p. 470.). The female is gravid eight months, and brings forth one at a birth. It was formerly abundant throughout the kingdom, but is now, in consequence of the influence of society, nearly confined to the remoter districts of Scotland and England. In some of the latter regions it proves very destructive to corn in harvest, but is gradually disappearing with the extension of sheep-farming.

The fossil remains of this species are widely distributed, occurring in peat and marl-beds, clay, and the silt of rivers. The horns, which chiefly attract notice, and find a place in geological collections, are of larger dimensions than those which belong to the recent individuals. The same remark applies to the fossil ox. Nor need this circumstance excite surprise, when we take into consideration the extensive forests and meadows with which the country abounded, furnishing protection and sustenance; and the advanced age to which many individuals might, when free from the persecution of man, be permitted to attain.

40. C. *Capreolus.* Roe.—Horns branched, round, erect, with bifid summits.

Capreolus, *Merr.* Pin. p. 166.—*Sibb.* Scot. p. 9.—Capria Plinii, *Ray*, Quad. p. 89.—C. cap. *Lin.* Syst. 1. p. 94.—*W*, Jwrch; *G*, Earha.

The height of this species is about 2¼ feet. The female is gravid five months and a half, and produces two at a birth. This species was formerly equally extensively distributed with the stag, but is now in a great measure confined to the district of Scotland to the north of the Forth. In Fife they have reappeared of late years, in consequence of the increase of plantations.

41. C. *Dama.* Fallow-Deer.—Horns branched, recurved, compressed, and palmated at the top.

Dama, *Merr.* Pin. p. 166.—C. platyceros, *Ray*, Syn. Quad. p. 85.—C. D. *Lin.* Syst. 1. p. 93.—*W*, Hydd.

This species is more gentle in its dispositions than either of the preceding, and is consequently better fitted for being kept in parks. The female is gravid eight months, and produces one, two, or even three at a birth. Doubts seem to be entertained whether the fallow-deer be an indigenous animal, though the evidence on which its claims rest is far from doubtful. Lesley (De Or. Scot. p. 5.) mentions, among the objects which the huntsman pursued with dogs, "Cervum, *damam*, aut capream." In the Statistical Account of Ardchattan, Argyleshire (vol. vi. p. 175.), it is said, that "fallow-deer run wild in the woods, of a much superior size and flavour to any of their species that are confined in parks." Indistinct traces of this species seem likewise to occur among the alluvial deposits. Thus, Professor Buckland (Rel. Dil. p. 18.) found teeth in the Kirkdale Cave, "nearly of the size and form of the fallow-deer." In the Statistical Account of the Parish of Kinloch, Perthshire (vol. xvii. p. 478.), a pair of large deer's horns are said to have been found in a marl-pit at Marlee, and, " from their superior size and palmed form, they appear to be the horns of the elk-deer." Among the donations to the Royal Society of Edinburgh, there is recorded (Trans. Royal Soc. vol. i. part 1. p. 77.), " By the Honourable Lord Dunsinnan,—a painting in oil of the head and horns of an elk, found in a marl-pit, Forfarshire." Whether these two examples from marl-beds should be referred to the fallow-deer or the Irish elk, may admit of some doubt, though it is probable that they belong to the former.

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The British Pecora appear to have experienced changes, by which the number of species has been reduced, though we possess no records to determine the æra of their extirpation.

1. *Irish Elk.*

This species, now unknown in a recent state, was first described by Dr Molyneux (Phil. Trans. No. 227.). " From the extreme tip of each horn it measured 10 feet 10 inches, and from the tip of the right horn to its root 5 feet 2 inches." It is of frequent occurrence in the beds of shell-marl, beneath peat, in the Irish bogs. In England, it has several times occurred in a similar situation, and in clay and gravel at Walton, in Essex. A splendid, and nearly perfect specimen from the Isle of Man is preserved in the Edinburgh Museum.

2. *Antelope.*

The only notice of any animal of this kind ever having inhabited the British Islands, is contained in a paper giving " An account of the peat-pit near Newbury, Berkshire," by John Elliot, M. D. " A great many horns, heads, and bones of several kinds of deer, the horns of the *Antelope*, the heads and tusks of boars, the heads of beavers, &c. are also found in it; and I have been told, that some human bones have been found; but I never saw any of these myself, though I have of all the others." Phil. Trans. 1757, p. 112.

The following passage of Torfæus (Hist. Orc. cap. 36.), would lead to the belief that the *Rein-deer* once dwelt in the mountains of Caithness, were it not extremely probable that Red-deer were intended, " Consueverant Comites in Catanesian, indeque ad montana ad venatum caprearum rangiferorum quotannis proficisci." Several attempts have been made by the Duke of Athol and others to introduce the rein-deer into the country, but these have hitherto failed.

BELLUÆ.

Gen. XXVI. EQUUS. Horse.—Hoof entire, with six incisors in each jaw.

42. E. *Caballus.* Mane and tail with thick flowing hair.

The mare goes with young eleven months, and seldom produces more than one. The milk incisors begin to protrude themselves five days after birth. At two and a half years, the two middle teeth are replaced by permanent ones; at three and a half the two adjoining ones; at four and a half, the two outer or corner teeth. All these are at first hollow in the middle of the summit, with a dark spot, but, by use, the concavity becomes shallower, and between the age of seven and eight, the spot disappears, and the animal is then said to have *lost mark.* The tusks of the lower jaw appear at the age of three and a half years, those in the upper at four; they remain sharp pointed till six, after which they become blunt, and exceed in length.

That this animal should be regarded as indigenous, need scarcely require proof. It lives and propagates, nearly in a state of nature in the Highlands of Scotland, and the Zetland Islands. In the latter of these districts, the use of *a stable* was dispensed with, until lately. The remains of the species occur associated with those of the most ancient of our native quadrupeds, as in the Cave of Kirkdale, (*Buckland's* Rel. Dil. p. 18).

The Britons, at a very early period, paid great attention to the horse, as appears from the excellency of their cavalry, according to the testimony of Cæsar (Com. lib. iv. 33.), and the present stock is unequalled, whether destined for the draught, the saddle, the turf, or for war. The breeds which may be regarded as nearest in character to the original stock, dwell in the more mountainous and inaccessible districts, where deficiency of food restrains them to a diminutive size.

GEN. XXVII. SUS. BOAR.—Hoof divided, with six incisors in each jaw.

43. S. *Scrofa*. Back bristled in front, tail hairy.

The sow is gravid four months, and, in a domesticated state, has been known to produce twenty pigs. This species was formerly abundant in a wild state, and the bones of individuals are occasionally found in marl-beds, clay, gravel and caves. The cultivated breeds are numerous, and chiefly distinguished by the thickness of fur, or length of leg. In one variety the hoof is undivided. The ears are pendulous in some, and erect in others.

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By the influence of civilization, the Ass *(Equus Asinus)* was added to the stock of our useful quadrupeds, so early as the close of the tenth century, at least in the reign of Ethelred. It is occasionally employed as a beast of burden in mines, seldom for the saddle. Other species of Belluæ, however, have suffered extirpation here, and elsewhere have become extinct.

1. *Mammoth.*

This is a species of elephant *(Elephas primigenius)*, which, judging from the distribution of its remains, was a native of the temperate and cold districts of the northern hemisphere. The tusks, teeth, &c. occur in the silt of rivers, beds of marl, clay, gravel, and in caves. The markings of the teeth distinguish it as a species from any of the recent kinds, and the condition of the fur, in the individual found in ice at the mouth of the Lena in Siberia, indicated its fitness to reside in a cold climate. Mr Trimmer gives figures of two young teeth, found in clay near Brentford, which he hastily refers to the Asiatic and African recent species, (Phil. Trans. 1813, p. 131. tab. viii. f. 1. 2).

2. *Extinct Rhinoceros.*

This species appears to have been contemporary with the mammoth, and to have possessed the same geographical distribution. In this country its remains occur in all the situations in which those of the mammoth have been detected.

3. *Extinct Hippopotamus.*

Doubts exist respecting the claims of this species to be regarded as different from the existing African species. The bones are found in similar situations with those of the two preceding animals, but the geographical distribution of this species appears to have been different, the individuals having been more confined to the temperate regions. In this country, it has occurred in Lancashire under a peat-bog,—at Kirkdale in a cave (Buckland, Rel. Dil. p. 18.), and in clay at Brentford, where, according to Mr Trimmer, six tusks were found in turning over an area of 120 yards. (Phil. Trans. 1813, p. 135).

APODA.

IN this great division of truly aquatic animals, so little is known of their history, and of the limits of their geographical distribution, that we are at a loss to determine what species should be regarded as genuine natives, and what as merely occasional visitants of our shores. It is judged expedient to enumerate all those which have been detected in our seas, even though they may have been stragglers, for the purpose of increasing the facilities of those who enjoy, occasionally, a favourable opportunity for determining the species which are rare, and the characters of which are consequently obscure. It is particularly recommended to such naturalists to be minute in their observations and descriptions, in order to advance our knowledge of the different kinds of British whales, the characters of many of which are still involved in much uncertainty and confusion.

HERBIVORA.

GEN. XXVIII. MANATUS. LAMANTINE.—Grinders eight on each side, with two transverse ridges.

44. M. *borealis*. Sea-Cow.—When full grown, extending to 28 feet in length.

Manati, *Ray*, Quad. 193.—Trichechus manatus, *Lin.* Syst. 1. 49.—*Stewart*, El. 1. 125.

In this animal, the fore-swimmers (fins or paws) are furnished with the rudiments of nails. In youth there are two small incisors in the upper jaw; the gape is small, the lips double, and the mouth is beset with white tubular bristles. This species inhabits the western shores of America and Kamtschatka. In Greenland it is rare, as only one mutilated specimen occurred to Fabricius.—Fauna, Gr. p. 6.

The only example of its occurrence in Britain is recorded by Mr Stewart in his work quoted above: "The carcase of one of these animals was, in 1785, thrown ashore near Leith. It was much disfigured; and the fishermen extracted its liver and other parts, from which a considerable quantity of oil was obtained." I was subsequently informed by Mr Stewart, that it came ashore at Newhaven in the harvest season; though it had been dead for some time, and was in a putrid state, he was able to satisfy himself with regard to the species.

It is probable that other species of the animals of this group do live in our seas, and occasionally give rise to the reports which have appeared, in by no means a questionable shape, of *Mermaids*. Whether these belong to the Manatus or Rytina, must be left to future observers; but the following particulars, which have been very properly communicated, of a Zetland mermaid, captured in Yell Sound in the summer of 1823, by an intelligent naturalist, Laurence Edmondstone, Esq. surgeon, Unst, from the reports of the fishermen, here merit a place:

"The animal was about 3 feet long, the upper part of the body resembling the human form, with protuberant mammæ like a woman; the face, forehead and neck, short, and resembling those of a monkey; small arms, which it kept folded across its breast; distinct fingers, not webbed; a few stiff long bristles were on the top of the head, extending down to the shoulders, and which it could erect or depress at pleasure, something like a crest. The lower part of the body like a fish; the skin smooth, and of a grey colour. It offered no resistance, nor attempted to bite, but uttered a low, plaintive sound. The crew, six in number, took it within their boat, but superstition getting the better of curiosity, and not aware of a specific remuneration for carrying it to land, they carefully disentangled it from the lines, and a hook which had accidentally fastened in its body, and returned it to its native element. It instantly dived, descending in a perpendicular direction."—"I have since seen the skipper of the boat, and one of his crew, and learned these additional details. They had the animal about three hours within the boat. The body without scales or hair, silver-grey above, whitish below, like the human skin—no gills were observed—no fins on the back or belly—tail like that of a dog-fish—very thick over the breast—by the eye, the girth might be between two and three feet—the neck short, very *distinct* from the head and shoulders—the body rather *depressed*—the anterior extremities very like the human hand, about the length of a seal's paw, webbed to about an inch of the ends of the fingers—mammæ as large as those of a woman—mouth and lips very distinct, and resembling the human." These particulars are contained in two letters to Professor Jameson, dated 10th and 14th August 1823, and published in the Edinburgh Magazine for September 1823, p. 346.

CETACEA.

I. *Palate covered with baleen. Jaws destitute of teeth.*

A. *Back furnished with a protuberance or fin. Piked Whales.*

GEN. XXIX. BALÆNOPTERA.—Pectoral skin folded longitudinally, and capable of being inflated.

45. B. *Musculus*. Round-lipped Whale.—Margin of the under lip semicircular.

De Balæna tripinni quæ maxillam inferiorem rotundam, et superiore multo latiorem habuit, *Sibb.* Phal. p. 78. tab. iii.—B. musculus, *Linn.* Syst. 1. 106.—Balænoptera acuto-rostrata, *Scoresby*, Arct. Reg. i. 485. tab. xiii. fig. 2.

A male of this species, according to Sibbald, 78 feet in length, came ashore at Abercorn, in the Frith of Forth, in September 1692. Its circumference was about 35 feet. The lower jaw was 13 feet 2 inches in length. The gape large and triangular. The upper jaw was narrower, becoming pointed towards the extremity; and was embraced by the longer and wider under jaw. The tongue was convoluted, 15 feet 7 inches in length, and 15 feet at the broadest part. The baleen (or whalebone) was 3 feet in length. From the snout to the eyes 13 feet 2 inches—from the angle of the mouth to the pectoral swimmers 6 feet 5 inches; these were 10 feet long, and 2½ feet where broadest. Dorsal fin 3 feet long, 2 feet high, and distant from the middle of the tail 12 feet 10 inches. From the lower jaw to the navel, the skin on the belly was regularly folded. Tail 18½ feet wide. This individual had been known to the fishermen for twenty years, in its pursuits after the herring, and termed by them *Hollie Pike*, in consequence of the dorsal fin having been perforated by a bullet.

The animal killed in Scalpa Bay, November 14. 1808, of which Mr Scoresby gives a figure and description from the notes of the late James Watson, Esq. of Orkney, seems, from its dimensions, to have been a young animal. The remarkable gibbosity of the lower jaw expressed in the figure, and which corresponds tolerably well with Sibbald's delineation, leads me to consider it as the Musculus. "Its length was 17½ feet; circumference 20. Length from the snout to the dorsal fin 12½ feet; from the snout to the pectoral fins 5 feet; from the snout to the eye 3½ feet; and from the snout to the blowholes 3 feet. Pectoral fins 2 feet long, and 7 inches broad; dorsal fin 15 inches long by 9 inches high; tail 15 inches long by 4½ feet broad. Largest whalebone about 6 inches."

According to Low (Nat. Hist. Orcad. p. 158.), they are seen in the Orkney seas in July and August, when herring and mackerel are abundant. And Dr Walker states (Essays, p. 529.), that they yearly frequent Loch Fyne during the herring season.

45. B. *Boops*. Sharp-lipped Whale.—Snout pointed.

De Balæna tripinni quæ rostrum acutum habet, et plicas in ventre, *Sibb.* Phal. 68. tab. i. lowest figure.—B. B. *Linn.* Syst. i. 106.—B. rostrata, *Hunter*, Phil. Trans. 1787, p. 373. tab. xx.—Fin-Whale, *Neill*, Wern. Mem. i. p. 201.

The specimen described by Sibbald, which came ashore in November 1690 near Burntisland in the Frith of Forth, was 46 feet in length, and 20 in circumference. The pectoral swimmers were 5 feet from the eye, and the dorsal fin 8½ from the tail. From the navel to the snout 24 feet. Breadth of the tail 9 feet. The lower jaw, near the middle, was 4 feet in breadth, with a thickened margin. Tongue 5 feet long, and near the root 3 feet in breadth. The blow-holes were 6 feet 8 inches from the snout. The length of the gape 10 feet. Eyes 3 feet from the blow-holes. The swimmers were 5 feet long, and 1½ broad.

The individual examined by Hunter was caught on the Doggerbank, and was 17 feet long. Upper jaw, from eye to eye, 1 foot 8 inches; lower jaw 2 feet 6 inches. It had 7 vertebræ in the neck, 12 which may be reckoned to the back, and 27 to the tail, making 46 in the whole. The sternum was flat, and of one bone, to which the first rib was articulated. There were 300 laminæ of baleen, the greatest length of which was 5 inches, and the two jaws met every where along their surface. The stomach consisted of five bags, the two first being the largest. The duodenum had longitudinal rugæ or valves. Furnished with a cæcum. In the stomach were found the remains of the dog-fish. Tongue little raised, having scarcely any lateral edges.

In a male fin-whale examined by Mr Neill, and which came ashore at Alloa on the banks of the Forth, the length was 43 feet, and the greatest circumference 20. Swimmers 5 feet long, and 1 broad. Dorsal fin 2½ feet high, and nearly of the same breadth at the base, seated nearly over the vent, and about 12 feet from the extremity of the tail, the last being 10 feet broad. Under jaw 14 feet long, 3 inches longer than the upper, and a little wider. There were about 300 laminæ of baleen on each side, the largest 18 inches long. Distance from eye to eye 7 feet. Mr Neill mentions having examined a MS. account of another whale, by the late Dr Walker, which was cast ashore at

Burntisland 10th June 1762, and which, in size and other particulars, agreed with the one which came under his own observation.

I have brought these three descriptions together, under the conviction that they all refer to one species. Hunter, it is true, considers his individual as belonging to the *Balæna rostrata* of Fabricius (Faun. Grœn. p. 40.), but the description there given conveys nothing precise in form or dimensions, except that it is the least of the baleen whales, and it may not differ from the Boops of the same author. Fabricius, in describing the last species, states, " Rostrum rectum, elongatum magis magisque angustatus, desinens tamen apice satis lato obtusoque. Ante nares in vertice capitis tres ordines convexitatum circularium, huic forsan peculiare quid. Maxilla inferior superiore parum brevior strictiorque versus superiorem oblique tendens." " Magnitudo ejus interdum 50–54 pedum ;" p. 36. These characters indicate a species different from the one described by Sibbald and Neill, and may justify the adoption of the *Balænoptera jubartes* of M. Lacepede, characterised as having tuberosities near the blow-holes. Sir Charles Giesecké, in the article GREENLAND (Edin. Encyc. vol. x. p. 499.), states that the *B. Boops* comes regularly to the coast about the end of July. It is " a smaller kind of whale, its length being from 20 to 25 feet. It has a fin on its back, and also a protuberance which grows towards the tail." " The whalebones of this species rarely exceed the length of one foot." Are we to rely on the size in the determination of the species, and consider the *B. rostrata* as a distinct species limited to 25 feet in length, and represented by the *rostrata* of Fabricius and Hunter, and the *boops* of Giesecké? Future observers may determine the point.

Both the *B. musculus* and *boops* may be considered as regular inhabitants of our seas. On the 20th August 1822, I observed an individual of the latter species at Longhope, Orkney.

GEN. XXX. PHYSALIS. RAZOR-BACK.—Skin destitute of pectoral folds.

47. P. *vulgaris.*—Length reaching to a hundred feet.

Balæna Physalis, *Fab.* Fauna Gr. p. 35.—*Walker's* Essays, p. 528.—Balænoptera Gibbar, *Scoresby*, Arc. Reg. i. 478.

According to Fabricius, the length of the baleen does not exceed a foot. It swims swiftly, and is with difficulty captured. Mr Scorseby states that he has made several ineffectual attempts to secure this species. The animal, when exerting its energies, dives and swims with such rapidity as to defy the ingenuity of the whaler. He states, from report, that it has been found 105 feet in length, and 38 in cirfumference ; " head small when compared with that of the common whale ; fins long and narrow ; tail 12 feet broad, finely formed ; whalebone 4 feet in length, thick, bristly, and narrow ; blubber 6 or 8 inches thick, of indifferent quality ; colour bluish-black on the back, and bluish-grey on the belly ; skin smooth, excepting about the sides of the thorax, where longitudinal rugæ or sulci occur." From his own observation, he states, that " it seldom lies quietly on the surface of the water when blowing, but usually has a velocity of four or five miles an hour ; and when it descends, it very rarely throws its tail in the air, which is a very general practice with the *mysticetus*.

The individual mentioned by Sibbald (Phail. p. 84.) as having come ashore at Boyne in Banffshire, probably belonged to this species. It was 80 feet in length, exclusive of the tail. Dr Walker states, that this species sometimes comes ashore on the Island of Lewis. It is, however, in all probability, only a straggler.

Relics of a whale, of a large size, and probably belonging to *Balænoptera musculus*, or to the preceding species, occur in the marine diluvium of the Forth.

B. *Back destitute of a protuberance or fin.*

GEN. XXXI. BALÆNA. WHALE.—Upper lip whiskered. Head large.

48. B. *Mysticetus.* Common Whale. Gape of the mouth arched.

Scoresby's Arct. Reg. i. 449. tab. xii.

The intelligent author whom we have now quoted, and whose figure is the only one worth quoting, considers a full grown whale of the ordinary size as not exceeding 60 feet in length, and 40 feet in circumference, and as weighing about 70 tons, the blubber 30 tons. "The upper jaw, including the crown bone or skull, is bent down at the extremity so far as to shut the front and upper parts of the cavity of the mouth, and is overlapped by the lips in a squamous manner at the sides." The swimmers are placed about 2 feet behind the angle of the mouth. The tail reaches to 26 feet in breadth. Laminæ of baleen 300 in number in each series, and sometimes 15 feet in length; the whole weighing a ton and half. A slight beard, consisting of a few short scattered white hairs, surmounts the anterior extremity of both jaws. Its food consists of small marine insects. Sir Charles Giesecké (Article *Greenland*, Ed. En. x. 499.) states the length of a female, killed in the spring of 1813, at 67 feet. Another killed in 1811, measured as follows: "From the centre of the mouth to the point of the tail 56 feet. From the point of the under lip to the root of the fins, 23½ feet. From the fins to the point between the two lobes or wings of the tail 33 feet. The length of the head was 18 feet. From the middle point of the upper lip to the blowholes 16½ feet. The length of one of the fins 8 feet 4 inches. The thickness of a fin, on its thickest part, 1 foot 9 inches. The breadth of the tail from one extremity of its wings to the other, 22 feet 7 inches. The length of one of the blowholes 11 inches. There were thirteen ribs on each side."

Sibbald (Phal. p. 65.) states, that an individual of this species came ashore near Peterhead in 1682, and measured 70 feet. The species referred to by Willoughby (Ichthyologia, p. 37.), as having come ashore at Tynemouth, was probably a Physalis, as it is stated to have been 30 yards in length, and to have had 30 ribs.

Though the whale appears formerly to have been frequently met with in our seas, yet now, when the fishery is prosecuted with zeal and success, and the geographical limits of the species, in consequence, greatly reduced, it scarcely merits a place among British animals, as it occurs only at distant intervals as a straggler.

I. *Palate destitute of baleen. Furnished with teeth, external orifice of the blow-hole single.*

A. *Blow-hole double, being divided within by a bony septum.*

a. *Teeth, numerous, in both jaws.*

GEN. XXXII. DELPHINUS. DOLPHIN.—A dorsal fin. Destitute of a cæcum.

1. *Snout short and blunt. Phocæna of* Cuv.

49. D. *Phocæna.* Porpess.—Teeth compressed and oblique.

Sibb. Scot. 23.—*Will.* Ich. p. 31.—*Borl.* Corn. p. 264. tab. xxvii. f. 2.—*Monro*, Phys. Fishes, p. 45. tab. xxxv.—*Fleming*, Phil. Zool. ii. p. 209

tab. i. f. 4.—In the British seas near the shore, at all seasons, and termed Meersuine, Herring-Hogs, Neessock, Pellock, and Bucker.

This species seldom exceeds 6 feet in length, and usually occurs in the most sheltered bays and friths, generally in pairs, and is irregular in its motions. In a female which I examined, 5¼ feet in length, the dorsal fin was 8 inches broad, and 5 high, and 2 feet 7 inches from the nose. Swimmers 3½ inches broad at the base, 7 long, and 13 from the snout. Nose to the eye, 6 inches. Nose to the blow-hole, 7 inches. Nose to the anus, 3 feet 7 inches. Gape, 4 inches. The under jaw half an inch longer than the upper, and rather pointed than obtuse, considering the size of the animal. Teeth, 54 in the upper-jaw, and 47 in the lower. Weight, 130 pounds. The fœtus, a male, was fully formed, though only 7 inches long, and as there was milk in the teats, the period of parturition was at hand. This one was found dead 30th November. Hunter states that there are five cervical vertebræ, and one common to the neck and back, fourteen proper to the back, and thirty to the tail. Ribs, 16 on each side.—The flesh of this animal was formerly held in estimation. Malcolm IV. granted to the Monastery of Dunfermling, " Capita piscium qui dicuntur *Crespeis* præter linguam, qui in meo dominio ex illa parte Scottwater applicuerint, in qua parte illorum ecclesia sita est."—Sib. Fife. 295.

50. D. *Orca*. Grampus.—Teeth conical, swimmers broad, and rounded.

Orca, *Sibb.* Phal. p. 17.—*Hunter*, Phil. Trans. 1787, p. 373. tab. xvi., xvii. —In herds in the British seas and friths, at all seasons.

The grampus reaches to 24 feet in length. The lower jaw is said to be wider than the upper, and the teeth to be about thirty in number. This species is gregarious, and moves rapidly forward in the water. When it comes to the surface to respire, it remains, like the porpess, but for an instant, and then dives, describing, however, in its course a much wider arch. In the Frith of Tay, it goes nearly as far up as the salt-water reaches, almost every tide at flood, during the months of July and August, in pursuit of salmon, of which it devours immense numbers. Hunter found in the stomach of one which he examined, a portion of a porpess. We are still in want of a good description of this species. The *D. gladiator* of Lacepede, constituted from a drawing and description of one taken in the Thames 1793, is regarded by Cuvier as not distinct from *D. Orca.* The dorsal fin is considered as situate nearer the head than in the grampus, and to be higher and more pointed.

51. D. *melas.* Ca'ing whale.—Teeth conical, swimmers long and narrow.

Neill's Tour through Orkney, p. 221.—*Traill*, Nicholson's Journ. vol. xxii. p. 81.—*Scoresby*, Arct. Reg. i. 496. tab. xiii. f. 1.—Common in herds from autumn to spring, especially in the northern islands.

Naturalists are indebted to Mr Neill for having first pointed out the distinguishing characters of this species as different from the grampus. Though it moves uniformly forward, its motion is slow, and when it comes up to blow, it remains several minutes on the surface. It is easily controlled in its motions, so that a whole herd is frequently driven ashore at once If one individual be wounded and takes the ground, the others will speedily take the same course, whence the origin of the name. The following observations on the animal by Dr Traill, are given by Mr Scoresby : " Body thick, black ; one short dorsal fin ; pectoral fins long, narrow ; head obtuse ; upper jaw bent forward ; teeth subconoid, sharp, and a little bent. This animal grows to the length of about 24 feet : the average length of the adults may be about 20, and their greatest circumference 10 or 11 feet. The measurements of one examined by Mr Watson, were as follow : length, 19½ feet ; greatest circumference, 10 ; pectoral fin (the external portion), 3½ feet long, by 18 inches broad ; dorsal fin, 15 inches high, by 2 feet 3 inches broad ; breadth of the tail, 5 feet. Another individual was 21½ feet in length; and a third 20 feet in length, and 11½ in circumference. The skin is smooth, resembling oiled silk; the colour is a deep bluish-black on the back, and generally whitish on the belly; the blubber is 3 or 4 inches thick. The head is short and round; the upper jaw projects a little over the lower. Externally it has a single spiracle. The full grown have generally 22 to 24 teeth, ¾ths to 1¼th inches in length, in each jaw. Mr Watson observed one with 28 teeth in the upper jaw, and 24 in the lower. In the aged animals some of the teeth are deficient: and in the sucklings none are visible. When the mouth is shut, the teeth lock between one another like the teeth of a trap. The tail is about 5 feet broad; the dorsal fin about 15 inches high, cartilaginous and immoveable," p. 497. Sand-eels have been found in their stomachs. This species is the *Grind* of the Faroe Isles, and probably the *Delphinus globiceps* of Cuvier.

2. *Snout produced. Delphinus of* Cuvier, vulgo *Bottle-noses.*

52. D. *Delphis.* Common Dolphin.—Teeth upwards of forty in each side of the jaws, slender, bent, and pointed.

Will. Ich. p. 28.—*Bor.* Corn. p. 264. tab. xxvii. f. 1.—*Hunter*, Phil. Trans. 1787, p. 373. tab. xviii.—Occasionally found on the British shores.

This species seldom exceeds 11 feet in length. Hunter found five cervical vertebræ, and one common to the neck and back; seventeen dorsal vertebræ, and thirty-seven caudal ones. Ribs eighteen. Sternum of three bones, and of some length.

53. D. *Tursio.*—Teeth, about twenty on each side, with obtuse summits.

Fabricius, Fauna Groen. p. 49. Del. truncatus.—*Montagu*, Wern. Mem. iii. p. 75. tab. iii.—Taken 3d July 1814 in Duncannon Pool, near Stoke Gabriel, about five miles up the River Dart.

British naturalists are indebted to the late George Montagu, Esq. for the few particulars which have been recorded of the only individual ever captured on our shores. It was 12 feet in length, and about 8 in circumference. From the snout to the blow-hole, 14½ inches. Summits of the teeth even with the gum. Colour black above, whitish beneath. The skull which came into Montagu's possession, was, including the upper jaw, 20½ inches; the breadth of the jaw across the hinder teeth, is nearly 5 inches; on each side there are sockets for twenty teeth, besides a long depression behind the posterior socket, for some other purpose. The under jaw is somewhat longer, containing twenty-three sockets on each side, making collectively in both jaws eighty-six teeth, a number little inferior to what has hitherto been noticed in any cetaceous animal described. The sockets are variable in size without order, shewing that some teeth were double the size of others, and the approximation of the sockets evinces the contiguity of the teeth, so that the teeth of both jaws must have opposed their surface to each other." The truncated appearance of the teeth, and their little elevation above the gum, seem to indicate the great age of the individual, and leave some doubt as to the original form of the summit. According to Fabricius, the front is rounded and declining, ending in a produced snout. The teeth in both jaws are distant, with obtuse summits, like the Beluga. Above black, belly whitish. In this description of the teeth, Fabricius seems to have contemplated them in position, while Montagu inferred their close connection, from the uncertain appearances of their alveoli, circumstances which seem to explain the only difference between the descriptions of the two authors.

GEN. XXXIII. DELPHINAPTERA. **BELUGA.**—Back destitute of a fin, but, in its place, the rudiments of a ridge.

54. D. *albicans*.—Snout abrupt, summits of the teeth truncated.

Delphinus albicans, *Fab.* Faun. Gr. p. 50.—*Dr Barclay* and *Mr Neill*, Wern. Mem. iii. 371. tab. xvii.—*Scoresby*, Arct. Reg. i. p. 500. tab. xiv. Rarely a visitant of the British seas.

The length of the beluga is from 12 to 18 feet. The jaws are equal. The teeth are nine on each side, in each jaw; in the lower, short, obtuse, and distant; in the upper, more acute and bent. The swimmers are subovate. The colour is usually white, occasionally with a tinge of red or yellow. It is gregarious and frequents the arctic seas, entering large rivers like the grampus. Two instances of the occurrence of this animal on our shores are now on record. One was killed near Stirling in June 1815; and Mr Bald having procured the specimen, it was submitted to Mr Neill and Dr Barclay for inspection, the former of whom has given an account of its external characters, the latter of its structure. The length of this individual was 13⅓ feet, its greatest circumference 8 feet 11 inches; breadth of the tail 3 feet; swimmers 2 feet long, and the same distance from the angle of the mouth; gape 10 inches. From angle of the mouth to the eye 2¾ inches. From tip of the upper jaw to the blow-hole 1 foot 10 inches. In the under jaw there were six teeth on each side, broad and blunt; in the upper jaw there were nine on each side, but none immediately in front, the three backmost sharp, and without any to match them in the lower jaw. It possessed four stomachs. The cervical vertebræ were 7 in number, the dorsal 11, and the lumbar 13. True ribs 6, and the false ribs 5 in number. Sternum broad and flat. The late Colonel Imrie informed Mr Neill, "that, in August 1793, he saw two young belugas, which had been cast upon the beach of the Pentland Frith, some miles east of Thurso. The length of the one, from the front of the forehead to the tip of the tail, was 7 feet, and of the other 7½. They were both males." Hans Egedé, in his Hist. Green. (London 1745) p. 75. when speaking of this whale, states, that "the train of his blubber is as clear as the clearest oil. His flesh, as well as the fat, has no bad taste, and when it is marinated with vinegar and salt, it is as well tasted as any pork whatever. The fins also and the tail, pickled or sauced, are good eating. This fish is so far from being shy, that whole droves are seen about the ships at sea. The Greenlanders catch numbers of them, of which they make grand cheer."

b. *Teeth few, and confined to one jaw.*

GEN. XXXIV. HYPEROODON.—Snout produced, with two teeth in the lower jaw, and the palate furnished with tubercles. With a dorsal fin.

55. H. *bidens*. Body reaching to the length of 25 feet.

Bottle-head, *Dale's* Harwich, 411. tab. xiv. (Pennant.)—Bottle-nose, *Hunter*, Phil. Trans. 1787, p. 373. tab. xix.—Physeter bidens, *Sowerby*, Brit. Misc. tab. i.—*Penn.* Brit. Zool. 2d edit. 111. p. 88.—Occasionally taken on the British shores.

This species varies much in size. That of Dale, taken near Maldon 1717, was 14 feet long, and 7½ in circumference. The one described by Hunter, taken above London Bridge 1783, was 21 feet long. The one figured by Sowerby, found near Brodie House, Elginshire, by James Brodie, Esq. was 16 feet long, and 11 in circumference. One of the individuals mentioned in the second edition of the British Zoology, taken in the Dee near Chester, October 1785, was 24 feet long, and 12 in circumference. Two others, left on the sands below Aber, Carnarvonshire, 1799, measured, the one 27 feet, the other 18, and the breadth of the tail of the largest was 6 feet. Sowerby says, "Head accuminated. Lower jaw blunt, longer than the upper, with two short, lateral, bony teeth. Upper jaw sharp, let into the lower one by two lateral impressions corresponding with the teeth. Opening of the mouth 1 foot 6 inches. Tongue smooth, vascular, small. Throat very vascular, rough. Under the throat are found two diverging furrows, terminating below the eyes, which are small, and placed 6 inches behind the mouth." Hunter observes, that there are only two small teeth in the anterior of the lower jaw, and that in the stomach he found the beaks of some hundreds of cuttle-fish.

GEN. XXXV. MONODON. NARWAL.—A straight tooth, projecting anteally from one side of the upper lip and jaw. Destitute of a dorsal fin.

56. M. *Monoceros.* Body subconical, head blunt, with a ridge extending from the tail to the middle of the back.

Unicornu marinum, *Tulpius*, Obser. Med. p. 376. tab. xviii.—Mon. mon. *Sowerby*, Brit. Misc. tab. ix.—Small-headed Narwal, *Fleming*, Wern. Mem. vol. i. p. 131. tab. vi.—Narwal, *Scoresby*, Arct. Reg. vol. i. p. 486. tab. xv. f. 1. 2.

Three individuals appear to have been found on the British shores. The one noticed by Tulpius, as found in June 1648, "in mari aquilonari, prope insulam Mayam," (usually considered as the May), was 22 feet long; but in this, the horn, which projected 7 feet, was probably included. The second individual was found 15th February 1800, at Frieston, near Boston, Lincolnshire. According to information which I received from Sir Joseph Banks (who had communicated his remarks to Lacepede, which, however, were misinterpreted, see Wern. Mem. i. p. 147.), in a letter dated 19th January 1809, "The animal, when found, had buried the whole of its body in the mud of which the beach there is composed, and seemed safely and securely waiting the return of the tide. A fisherman, going to his boat, saw the horn, which was covered up, and trying to pull it out of the mud, raised the animal, who stirred himself hastily to secure his horn from the attack." This specimen is stated to have been 25 feet in length, of which the tooth probably constituted 7. Sowerby in his drawing (which is equally bad with that of *Lacepede* Hist. Nat. des Cet. p. 159. tab. v. f. 2.), has added, from fancy, a second horn or tooth. The third individual, a male, found 27th September 1808, at the Sound of Weesdale, Zetland, has been described by me in the Wernerian Memoirs. It was a young animal, only measuring, from the snout to the tail, 12 feet, with a tooth projecting 27 inches. The length of this animal seldom reaches to 16 feet, and the circumference 9 feet. The forehead rises suddenly from the short snout, the outline then becomes slightly elevated over the blow-hole, after which a slight depression marks the neck. The first half of the body is nearly cylindrical, the remaining portion to the tail, conical. In this latter portion there is a dorsal and ventral low ridge, and less distinctly marked lateral ridges, giving it a subquadrangular form. The mouth is pointed before, and the upper lip projects a little beyond the under. Eye on a cross line with the blow-hole. It has one long tooth, projecting from the left side of the upper jaw (or intermaxillary bone) through the lip; hollow within and spirally twisted. Instances have occurred of two teeth, but the right one seldom appears. For some remarks on the mode of dentition of this animal and of the porpoise, see Phil. Zool. v. ii. 208–210. These tusks are sometimes 10 feet in length, and, according to Mr Scoresby, are peculiar to the males. The cervical vertebræ are 7, the dorsal 12, and the lumbar and caudal 35 in number. Ribs 6 true, and 6 false on each side. Live on fish and sepiæ, and usually keep in a herd of about a dozen. The following dimensions of a full grown male narwal are given by Mr Scoresby: "Length, exclusive of the tusk, 15 feet; from the snout to the eyes 1 foot 1½ inch—to the fins 3 feet 1 inch—to the back-ridge 6 feet—to the vent 9 feet 9 inches. Circumference—4½ inches from the snout, 3 feet 5 inches; at the eyes and blowhole, 5 feet 3½ inches; just before the fins 7 feet 5 inches; at the forepart of back-ridge, 8 feet 5 inches; at the vent 5 feet 8 inches. Tusk, length externally 5 feet ½ inch; its diameter at the base 2½ inches. Length of the blow-hole 1½ inch, and breadth 3½ inches. Tail 14 inches long, and 3 feet 1½ inch broad. Fins 13 inches long, and 7½ inches broad." The tooth is characteristic of the male. Instances, however, occur, though seldom, in which the female has a tooth. One is mentioned in Linn. Trans. xiii. 620.: "The sex of this animal was satisfactorily ascertained in cutting up, when two fœtuses were taken out of it."

B. *Blow-hole single, being destitute of the bony septum. Teeth in the lower jaw, with cavities in the upper for their reception.*

GEN. XXXVI. PHYSETER, *(Artedi).* FINNER.—Furnished with an elevated dorsal fin.

57. P. *Tursio.*—Summits of the teeth flat.

De Balæna macrocephala tripinni, quæ in mandibula inferiore dentes habet minus inflexos et in planum desinentes, *Sibb.* Phal. p. 43. a tooth tab. ii.—Physeter pinna dorsi altissima, apice dentium plano, *Artedi*, Gen. p. 74.—Ph. Tur. *Linn.* Syst. 1. p. 107.—High-finned Cachalot, *Penn.* Brit. Zool. iii. p. 64.—On the Scottish coast, rare.

In the example mentioned by Sibbald, a female, which came ashore in Orkney in 1687, the head was 8 or 9 feet in height; the blow-hole in front; the tusks were but little bent, and nearly solid externally, or with only a lateral slit or a small cavity. Some of the teeth were 4 inches long. The dorsal fin was erect, like a mizen-mast. It yielded good spermaceti.

58. P. *microps.* Spermaceti Whale.—Teeth bent, with acute summits.

De Balæna macrocephala, quæ tertiam in dorso pinnam sive spinam habet, et dentes in maxilla inferiore arcuatos falciformes, *Sibb.* Phal. p. 33. tab. i.—Ph. maxilla superiore longiore, spina longa in dorso, *Artedi*, Gen. p. 74.—P. microps, *Linn.* Syst. i. p. 107.—*Fab.* Faun. Gr. p. 44. —Great-headed Cachalot, *Low's* Orkney, p. 160.—On the Scottish coast, frequent.

A male of this species was found at Limekilns in the Forth in February 1689, and described by Sibbald. It was 52 feet long. The upper jaw projected 2½ feet beyond the lower. Lower jaw 10 feet long, and narrower than the upper towards the extremity. From the snout to the eyes 12 feet. In the lower jaw were 42 teeth, 21 on each side (Fabricius states the number as 11 on each side), curved, and ending in an acute point, the largest of which were 9 inches long, and the least 7 inches. These projected 3 inches above the gums, and contained a large cavity at the root. Swimmers 4 feet long. The tail was 9 feet broad. Mr Low states, that this species frequently comes ashore in Orkney. One was caught at Hoy 50 feet long.

GEN. XXXVII. CATODON, (*Artedi*). CACHALOT.—Back destitute of an elevated fin.

59. C. *macrocephalus*.—Snout truncated. Teeth conical.

Balæna macrocephala que binas tantum pinnas laterales habet, *Sibb.* Phal. 30.—Catodon fistula in cervice, *Artedi*, Gen. p. 79.—Phys. mac. *Linn.* Syst. i. p. 107.—*Fab.* Faun. Groen. p. 41.—Blunt-headed Cachalot, *Robertson*, Phil. Trans. 1770, p. 321. tab. ix.—*Penn.* Brit. Zool. iii. p. 61. tab. vi. a bad figure.—In the Scottish sea, rare.

An individual of this species ran ashore upon Cramond Island in the Forth, December 22. 1769, which Mr Robertson has described. Its length was 54 feet, and its greatest circumference, behind the eyes, 30. The head occupied nearly one-half of the whole animal. A protuberance on the back, opposite the penis. The tail was 14 feet broad. Lower jaw 11 feet long, with 23 teeth on each side, each 2 inches long, and all pointing a little outwards. Upper jaw projecting 5 feet over the lower, with a cavity for the reception of the lower jaw, blunt, 9 feet high, and the blow-hole was seated at the dorso-anteal extremity. Swimmers 5 feet behind the corners of the mouth, 3 feet long and 1½ broad. From the corner of the mouth to the penis 19 feet, to the anus 24, and to the tail 38. Cavity of the head filled with spermaceti along with the brain. Fabricius states that the teeth are conical, 40 to 46 in number, and that between the pits in the upper jaw the rudiments of teeth exist, much bent, lying horizontally, the apex only, oblique polished, appearing above the skin. Ribs 10 on each side. According to Schwediawer (Phil. Trans. 1783, p. 241.), the blow-hole bends obliquely on the left.

60. C. *Sibbaldi*.—Teeth with truncated summits.

De Balænis minoribus in inferiore maxilla tantum dentatis, sine pinna aut spina in dorso, *Sibb.* Phal. p. 24.—Catodon fistula in rostro, *Art.* Gen. p. 78.—Phys. Catodon, *Linn.* Syst. i. p. 107. Orkney, rare.

A herd of this species, upwards of 100 in number, are stated by Sibbald to have been found at Kairston, Orkney, the individuals of which were from 2 to 24 feet in length. Head round; gape small; and the teeth about half an inch above the gums. "In rostro nares habebant," "et asperitatem quandam in dorso." The claims of this species, to rank as distinct from the preceding, chiefly rest on the truncated teeth.

Documents are wanting to enable us to determine the influence of society on the geographical distribution of British whales, though it has probably been considerable. To some physiological revolutions they seem to have been exposed, as three examples of their bones have occurred in marine diluvium, in peculiar situations, but the species to which they belong cannot as yet be determined. The first occurred at Airthrey, on the Forth, near Alloa. The bones belonged to an animal about 72 feet long, and were imbedded in clay 20 feet higher than the surface of the highest tide of the River Forth at the present day; "Mr Bald on the Skeleton of a Whale," Edin. Phil. Jour. vol. i. p. 393. The second consisted of one vertebra found 12 feet above the level of the sea in Strathpeffer, Ross-shire, and described by Sir George Mackenzie, Edin. Phil. Trans. vol. x. p. 105. The third occurred at Dunmore Park, Stirlingshire. The bones belonged to an individual 70 or 75 feet long, and were imbedded in clay 20 feet higher than that of the Forth; Edin. Phil. Jour. vol. xi. p. 220. and 415.

Relics of a marsupial animal connected with the genus Didelphis or Opossum, but not belonging to any known species, occur along with the remains of marine animals in the calcareous slate of Stonesfield, near Woodstock, in Oxfordshire, a rock which is considered as a member of the oolitic series.

Class II. BIRDS.

Class II. BIRDS.

- Order I. FISSIPIDES. Land Birds.—Toes free, and formed for grasping or walking.
  - Tribe I. TERRESTRES.—Tibial joint feathered.
    - Sect. I. Ambulatores.—*Three toes directed anteally, and fitted for walking or grasping*
      - I. *Nostrils hid under an arched covering. Wings short.*
        - GALLINADÆ.—Bill arched from the base. Eggs numerous.
        - COLUMBADÆ.—Bill swollen at the base, nearly straight, and subulate towards the extremity.
      - II. *Nostrils exposed or hid only by feathers.*
        - ACCIPITRES.—Bill and claws strongly hooked. Limbs strong. Tongue emarginate. Females largest.
        - PASSERES.—Bill nearly straight in the gape. No cere. Males largest.
    - Sect. II. Scansores.—*Two toes directed anteally, and fitted for climbing trees.*
  - Tribe II. GRALLÆ. Waders.—Lower end of the tibial joint and tarsus naked.
- Order II. PALMIPIDES. Water Birds.—Toes webbed to their extremity, and formed for swimming.

GALLINADÆ.

1. *Tarsus feathered.*

Gen. I. LAGOPUS. Grous.—Toes closely feathered above, with a simple margin. Tail of 16 feathers.

1. L. *scoticus*. Red Grous.—Plumage reddish-brown, mottled with pale spots, and black bars.

L. altera, *Will.* Orn. p. 128.—*Sibb.* Scot. p. 16.—Redcock, *Penn.* Brit. Zool. i. 269.—Tétras rouge, *Temm.* Manuel d'Ornithologie (1820), ii. p. 465.—*E*, Red Game, Gorcock, Moorcock; *S*, Moorfowl; *W*, Ceiliog Mynydd, Târfynydd; *G*, Coileach ruadh.—In open heathy moors, from Wales to Orkney.

Length 15½ inches, breadth 26, weight 20 ounces. *Bill* black, covered at the base with feathers. A spot of white feathers at the base of the lower mandible, and a circle of the same colour round the eyes. *Quills* 24, dusky; the first shorter than the second, and the third the longest. *Tail*-feathers black, the four middle ones barred with red. Above each eye is a rough, naked, scarlet spot, with the upper margin fringed. Tarsus and toes with fine cinereous feathers or hairs. The *female* is smaller, of a duller colour, and the scarlet spot less distinct. Pair in the spring. Eggs from 10 to 14 in number, dirty white, blotched with brown. The young or *pouts* are of a light colour. The young and parent birds keep in a *pack*, until the beginning of winter, when they associate in large flocks with other broods. Feed on berries, heath tops, and corn. Easily domesticated, and breed in confinement. This species is truly a native bird, being confined to the United Kingdom.

2. L. *vulgaris*. Ptarmigan.—Plumage cinereous, tinged with brown, with black and dusky spots and bars.

L. avis, *Will.* Orn. 127.—*Sibb.* Scot. 16.—*Penn.* Brit. Zool. i. 271.—Tetras Ptarmigan, *Temm.* ii. 468. *W*, Coriar yr Albin; *G*, Tarmachan. Confined to the highest mountains of Scotland.

Length 15, breadth 23 inches; weight 19 ounces. *Bill* black, more produced and less pointed than the preceding. From the gape to the eyes a black band. Above the eyes a lunulated, naked, scarlet spot. *Quills* 24, with white webs, and black shafts; the first shorter than the second, the third the longest. *Tail* feathers black, the middle ones variegated with pale brown. Tarsus and toes with cinereous feathers and hairs. In the *female* the black band from the gape is wanting. In *winter* the plumage becomes white, with the exception of the cheek band, the seven tail-feathers on each side, the shafts of the two middle ones, and of the quills, which are black. Eggs 10, white, with brown spots. It is a stupid bird. Breeds in confinement. Distributed in the alpine and arctic regions of Europe and America.

Gen. II. TETRAO.—Toes nearly naked above, with a pectinated margin on each side beneath.

3. T. *Tetrix*. Black-Cock.—Feathers of the throat not produced; tail forked, the two external feathers recurved.

Tetrao seu Urogallus minor, *Will.* Orn. 124.—*Sibb.* Scot. 16. T. tet.—*Linn.* Syst. i. 274.—*Penn.* Brit. Zool. i. p. 266.—T. birkhan, *Temm.* ii. p. 460.; *E*, Heath-hen, Black-game, Black-grouse or Moor-hen; *S*, Black-cock; *W*, Ceiliog dû; *G*, Coileach dubh.—In wild and wooded districts.

Length 23, breadth 34 inches; weight 48 ounces. *Bill* black. Irides hazel. A bare scarlet granulated spot over the eye. Head, neck, and body, glossy black, with a bluish tinge. *Quills* 26, the four first black, the others white at the bottom forming a white bar on the wing. Under coverts white. *Tail* of 16 feathers, nearly 7 inches long, square at the ends, the two or three external ones, on each side, 4 inches longer than the others. Under coverts white. The *female* is less, of a brown colour, barred and mottled with black, and the lateral tail-feathers are but little produced, and not recurved. *Eggs* 6 or 7, dirty white, with brown blotches. The young follow the mother. Food, consists of mountain-berries, heath, and birch-tops, and even corn. Dr Walker found the stomach stuffed with the leaves of *Polypodium vulgare*, after the bird had lived in woods during winter, (Hebrides, i. 337.) In Russia, this species is caught by "stakes, pointed at both ends, driven into the ground, approaching near each other at the bottom, but diverging at the top, so as to resemble a funnel or inverted cone. To the top of each stake is tied an oat-straw, with the grain on it. A long stake stands up in the middle of this machine, likewise crowned with oats. To this is attached a horizontal stick, vacillating freely within the cone. The birds come to eat the oats, and light on this stick. It gives way, and lets them fall into the cone, where not being able to use their wings, they remain prisoners." (Mem. Acad. Imp. des Scien. Peter. i. 189. p. 321. (Annals. of Phil. iii. 223.)

It may be proper to take some notice in this place of a bird, long considered as a hybrid between the cock of the wood and the black-cock. It is the T. *hybridus* of Sparman, (Mus Carls. fasc. i. tab. 15.) T. *intermedius* of Langsdorff, (Mem. Acad. Peter. iii. 1811, p. 236.) The *Tetras rakkelhan* of Tem. Orn. ii. p. 459. In this species the feathers of the throat are a little produced; head, neck and breast, black, with bronze and purple reflections; back and rump with ash-coloured dots. Length 27 inches. The female is unknown. This species is noticed as a native of Scotland by Brisson, under the name of Le coq de bruyere piqueté, and a Scottish gentleman told Dr Tunstall, who informed Dr Latham, that it existed in our woods. The subject merits attention.

II. *Tarsus naked.*

GEN. III. PERDIX. PARTRIDGE.—Cheeks with a naked skin. The three first feathers in the wing shorter than the fourth. Tail even and short.

4. P. *cinerea*. Common Partridge.—Bill and legs bluish-grey; face and throat reddish-brown.

P. ruffa, *Merr.* Pin. 173.—P. cin. *Will.* Orn. 118.—*Sibb.* Scot. 16.—*Penn.* Brit. Zool. i. 274.—*Temm.* Orn. ii. p. 488.; *W*, Cor-iar: *G*, Ceare-thomain.—In the neighbourhood of corn-fields.

Length 13, breadth 20 inches; weight 15 ounces. *Plumage* a mixed cinerous brown and black. Behind the eye a naked red warty skin. On the breast a deep bay-coloured mark in the form of a horse-shoe. *Quills* 23, brown. *Tail* of 16 feathers, brown, the four middle ones like the back. The *female* is smaller, the head less bright, and the ear-coverts are greyish. The mark on the breast is white for the first year, afterwards more or less like the male and by the third year is no longer a mark of distinction. Eggs from 12 to 20, of a wood-brown colour. Period of incubation three weeks. *Young* leave the nest in twelve hours, and are conducted to ant-hills, the eggs in which constitute their early nourishment. Their plumage is less distinctly marked than the old birds, and the legs are pale coloured.

5. P. *rufa*. Guernsey Partridge.—Bill and legs red. Throat and cheeks white, margined with black.

Will. Orn. 119.—*Mont.* Orn. Dict.—*Temm.* Orn. ii. 485.—Bred in Jersey.—Found in Guernsey, and occasionally in the south of England.

Length 12½, breadth 22 inches; weight 13 ounces. The plumage above is reddish-brown, breast ash-coloured, with the belly rufous. Quills 25, brown. Tail of 16 feathers, rufous, with the six middle ones tinged with grey. Eggs 15 or 18, yellowish, with red spots and cinereous dots.—This species is now common in several preserves in England, and may occasionally be found in a wild state, but the islands of the Channel seem to be the most western limits of its natural distribution.

Gen. IV. COTURNIX. Quail.—Cheeks covered with feathers. First quill-feather longest.

6. C. *vulgaris*. Common Quail.—Over each eye a yellowish streak, and one of the same colour down the forehead.

Merr. Pin. p. 173.—*Will.* Orn. 121.—*Sibb.* Scot. 16.—*Penn.* Brit. Zool. i. 276.—*Temm.* Orn. ii. 491. *W*, Sofliar.—In wheat-fields.

Length 7½, breadth 14 inches. The *plumage* is a mixture of black, brown, and ash. A dark line passes from each angle of the bill, forming a kind of gorget above the breast; and the middle of the chin is black. *Quills* dusky, the outer webs mottled with white. *Tail* of 12 feathers, dusky, tipt with white. The *female* differs, in wanting the black spot on the chin. Eggs 8 or 10, or even 20, yellowish, with dusky spots.—This species is a summer visitant, arriving in the beginning of May, and departing in October. A few occasionally remain.

Although these may be considered as the gallinaceous birds indigenous to the British Isles, there are several other species which here require to be noticed.

a. DOMESTICATED GALLINADÆ.

1. *Pavo cristatus*. Crested Peacock.

This bird, so truly ornamental, from the splendour of its plumage, and the magnificence of its train, is of Asiatic origin. The period of its introduction into this country is unknown, though probably not very remote.

2. *Meleagris Gallopavo*. Turkey.

This bird is a native of America. It was first imported into England in 1524. Multitudes are reared in Norfolk and Suffolk for the London market, to which they are driven in flocks, consisting of several hundreds. Where they are reared for sale, the cock is kept but a short time with the hens when they begin to *lay*, his presence, afterwards, during the period of the exclusion of the eggs, being unnecessary to render them prolific; Edin. Phil. Journ. v. 356. The same economy may be practised with the common hen. Will. Orn. 11. The turkey, in a wild state, is larger than with us, sometimes exceeding 30 pounds. *Pen.* Phil. Trans. 1781, p. 67.

3. *Gallus domesticus.* Common Fowl.

This is another bird of Asiatic origin, and probably introduced into this kingdom by the Phœnicians, while trading with the ancient inhabitants in tin. On the authority of Cæsar, it is supposed that they were domesticated, but not eaten. " Leporem et gallinam, et anserem gustare, fas non putant, hæc tamen alunt, animi voluptatisque causa ;" Com. lib. v.. Did Cæsar not here refer to some of the indigenous species of *Gallinæ*, which we have enumerated, and to which, as well as the hare, the Britons might have extended their protection, without keeping them in a tame state.

The following well marked varieties are cultivated : *Crested Cock*, having a tuft of feathers on the crown. *Dorking Cock*, with two toes behind. *Rumkins*, without tail feathers or oil-bag. *Frizzled Cock*, having the feathers curled inwards. *Bantam*, dwarfish tarsi, with long feathers behind.—In reference to this last, Sir T. F. Raffles, in his History of Java, vol. i. p. 349. says, " The cock which we improperly call the Bantam, is not found on Java, except as a curiosity : it comes from Japan."

4. *Numidia Meleagris.* Pintado or Guinea-hen.

This is a native of Africa. It is a restless bird, and its call, which is frequent, is truly grating; but the eggs and young are considered delicious eating.

5. *Phasianus Colchicus.* Pheasant.

This bird is of Asiatic origin. It was first brought into Greece from Phasis, a large river of Colchis, running into the Euxine. It is now generally distributed throughout the temperate districts of Europe. The breed in this country is preserved by the multitudes which are reared in confinement, and then turned out into the woods of the nobility and gentry, otherwise, what the climate spared, the poacher would speedily destroy. Two well marked varieties occur. The *common pheasant*, the most ancient, and the *ringed* pheasant, more recently introduced. A mixed breed is of frequent occurrence,—a circumstance unfavourable to the notion entertained by Temminck, "Orn. ii. 454." of the *Phasianus torquatus* being a distinct species.

Mr Edwards has given a figure and description of what was supposed a hybrid between a turkey and pheasant, shot near Pstandford, Dorsetshire ; Phil. Trans. 1759, 833. tab. xix.

b. EXTIRPATED GALLINÆ.

6. *Urogallus vulgaris.* Cock of the wood, or Capercaillie.

W, Ceiliog coed ; *G*, Capul coille.

This beautiful bird, which reaches to 2 feet 7 or 8 inches in length, and weighs 12 or 13 pounds, formerly frequented the fir-woods of Ireland and Scotland. In the latter country it was last seen in the woods of Strathglass, in 1760. It continued in Strathspey until 1745 ; St. Ac. (Kirkmichael, Banffshire, Rev. John Grant), vol. xii. p. 451. Recent attempts have been made to recruit our forests from Norway, where the species is still common.

c. STRAGGLERS.

7. *Coturnix Marilanda.* American Quail.

Montagu, in his Supplement to his Ornithological Dictionary (Article " Grossbeak"), mentions a male of this quail which was shot near Mansfield, by Mr Harrison, and afterwards sent to Lord Stanley. He adds, " The American Quail has been turned out in some part of the British empire, with a view to establish the breed, but we believe without effect. The late General Gabbit liberated many on his estates in Ireland, but in two years the breed was lost." Perhaps the stragglers now noticed may be referred to some of these liberated individuals.

COLUMBADÆ.

GEN. V. COLUMBA. PIGEON.—Head plain. Bill slender, flexible. Legs short.

7. C. *Palumbus.* Ring-Dove.—Plumage bluish-grey, with a white patch on each side of the neck.

> *Merr.* Pin. 175.—*Will.* Orn. 125.—*Sibb.* Scot. 17.—*Penn.* Brit. Zool. i. 296.—*Temm.* Orn. ii. 444.; *E*, Quist, Cowshot; *S*, Wood-pigeon, or Cushat; *W*, Ysguthan; *G*, Smudan.—In woods, common.

Length 28, breadth 30 inches; weight 20 ounces. Bill yellowish, reddish at the base. Feet red, claws black. Neck and breast iridescent. Belly whitish. Quills 24, the second longest, and the first ten black, edged with white. Tail of 12 feathers. No gall-bladder. *Female* less, with the white patch on the neck, less distinct. Eggs 2. Nest of a few sticks, loosely put together, on a tree. This bird is stationary, flying in flocks during winter, and feeding on greens, turnips, and young clover or wheat. Easily tamed, but will not breed in confinement.

8. C. *Oenas.* Rock-Dove.—Plumage bluish-grey, neck iridiscent.

> *Merr.* Pin. 175.—*Will.* Orn. 136.—*Sibb.* Scot. 17.—*Penn.* Brit. Zool. i. 290.—*Temm.* Orn. ii. 445.—*W*, Colommen; *G*, Caluman.—Common in a wild state, in caves on the shore.

Length 13½, breadth 22 inches; weight 11 ounces. Bill brown, point dusky. A broad bar across the middle of the greater coverts, and another on the ends of the secondary quills. Tip of the tail black. Pennant, Temminck, and some others, seem disposed to exalt the varieties of this pigeon into two species. The *C. Oenas* has the rump bluish-grey, while the *C. livia* has it white. But the individuals of this species vary considerably in their colour and markings, and induce us, with Montagu, to view them as constituting but one species. This species, in a domesticated state, exhibits numerous marked varieties, which Willoughby has enumerated in detail.

9. C. *Turtur.* Turtle-Dove.—Head and neck cinereous, with a patch of black feathers on the latter, tipt with white.

> *Merr.* Pin. 175.—*Will.* Orn. 134.—*Penn.* Brit. Zool. i. 297.—*Temm.* Orn. ii. 448.—A summer visitant of England.

Length 12, breadth 21 inches; weight 6 ounces. A space beneath and behind the eye purplish-red. The back is brown, dashed with cinereous; shoulders and coverts black, with reddish margins. Quills dusky, with pale edges. Tail black, tipt with white, the two middle feathers uniformly dusky.—The turtle visits the south of England in spring, returning in September. Inhabits thick woods. Makes its nest in a tree with sticks, and lays 2 white eggs. Varies in having the whole side of the neck black, with a round spot of white on each feather near the end.

ACCIPITRES.

RAPACIOUS BIRDS.

I. **DIURNÆ.** HAWKS.—Bill covered at the base with a cere, in which the nostrils are lodged. Eyes lateral. Outer toe (with the exception of Balbusardus) incapable of having its position or motion reversed.

* MACROPTERÆ. Noble Hawks.—*Second quill-feather longest; the first nearly equal. Bill arched from the base.*

† Claws flat or grooved on the under side.
Falco.
Gyrfalco.

†† Claws rounded on the under side.
Balbusardus.

** BRACHYPTERÆ. Ignoble Hawks.—*The third or fourth quill-feather longest; the first very short.*

† Tail forked.
Milvus.

†† Tail not forked.

1. Space between the bill and eye feathered.
Pernis.

2. Space between the bill and the eye naked or hairy.

a. Bill straight at the base, and bent at the extremity.
Aquila.

aa. Bill bent from the base. Tarsi plated.

b. Ear-feathers forming a collar like the owls.
Circus.

bb. Ear-feathers plain.
Buteo.

II. **NOCTURNÆ.** OWLS.—Bill without cere. Eyes large, directed anteally; surrounded with a circle of radiating wiry feathers, which serve to cover the base of the bill and auricles. The external toe capable of having its position and motion reversed. On the top of the head, in some species, are two tufts of long feathers, termed *horns* or ears.

* *Concha of the ear occupying the whole side of the head. The first or second quill the longest. Wings about the length of the tail.*

† Bill arched from the base. Head with horns.
Otus.

†† Bill straight at the base. Head destitute of horns.
Aluco.

** *Concha of the ear extending only to about one-half of the side of the head. Disc of feathers round the eye less perfect than in the preceding group.*

† Head with horns.
  Bubo.
  Scops.

†† Head without horns.
  Strix.

I. DIURNAL RAPACIOUS BIRDS.

GEN. VI. FALCO. FALCON.—Bill, with the margin of the upper mandible furnished with a sharp tooth, near the extremity, the lower with a notch for its reception.

a. *With Mustaches, or a black stripe, extending from the base of the bill, under the eye, along the cheeks, and a short way on the side of the neck.*

10. F. *peregrinus.* Peregrine Falcon.—Wings reaching the length of the tail.

Will. Orn. 43.—F. sacer, *Sibb.* Scot. 14.—Peregrine F., *Penn.* 1. 178.—Grey F., ib. 180.—F. per. *Tem.* Orn. i. 22.—*W*, Hebog tramor.—In rocky districts not uncommon.

Length 16½, breadth 37 inches. Bill blue; margin of the eye, cere, irides, and legs, yellow. Plumage, above, blackish-grey, darkest on the head, lightest on the rump; with obscure black bars. Throat, neck, and breast, white; the rest below white, with black bars; a few longitudinal spots of black on the breast. Middle toe as long as the tarsus. Quills dusky; inner web of the first abbreviated near the end. Tail-feathers 12, slightly tipt with yellowish-white. *Female* larger, the white beneath, tinged with red. Nest on rocks; eggs 3 or 4, reddish, with brown spots. *Young* birds have the plumage, above, inclining to cinereous; the feathers with a ferruginous border. Beneath, white, with longitudinal spots. Crown, neck, and cheeks, yellowish-white. Blackish patch under the eye. This species, long celebrated for its docility and activity in the chase, has been multiplied into numerous species, viz. *F. leucocephalus*, *fuscus*, *communis*, and *niger*. Feeds on the wild Gallinæ, chiefly, and even makes havock in the poultry-yard.

11. F. *lanarius.* Lanner.—Wings reaching only two-thirds the length of the tail.

Will. Orn. 48. *Linn.* Syst. i. 129. *Penn.* Brit. Zool. i. 182. tab. xxii. *Tem.* Orn. i. 20.—*W*, Hebog gwlanog.—Breeds in Ireland. Caught in a duck decoy, Lincolnshire.—*Pennant.*

Length 1 foot 7 inches. Margin of the eye, irides, and cere, yellow; bill and legs bluish. Crown red, with oblong brown spots. Above each eye, to the hind part of the head, a broad white line; and beneath each a blackish mark, pointing downwards: the last nearly disappearing with age. Plumage, above, brown with reddish margins; below, white, with longitudinal brown spots, except the under tail covers and throat. Middle toe shorter than the tarsus. Inner webs of the two first quills abbreviated. In the *female* the head is dark brown, and the throat and under tail-covers have narrow streaks.

12. F. *Subbuteo.* Hobby.—Wings reaching beyond the tail.

Will. Orn. 48. *Penn.* Brit. Zool. i. 197. *Tem.* Orn. i. 25.—*W*, Hebog yr Hedydd.—A summer visitant.

Length 12, breadth 27 inches; weight 7 ounces. Bill blue; irides hazel; margin of the eye, cere, and legs, yellow. The plumage, above, is bluish-black, the margins of the feathers paler; below, white, with longitudinal black spots. Above each eye a white line; hind-head with two yellow spots. Quills (the first of which is almost equal in length to the third), dusky black; the inner webs with oval transverse reddish spots. Rump, thighs, and vent, pale orange. Tail with brownish bars, the tips white; two middle feathers entirely of a deep dove colour. In the *female* the plumage has a reddish tinge. Nest placed on trees, rocks, or heath. *Eggs* 3 or 4. *Young* lighter coloured; feathers above bordered with yellowish red, especially the crown; below, tinged yellowish-red, with longitudinal brown spots.—The hobby pursues larks, and is occasionally used in hunting with the net, to frighten the birds and prevent them from taking wing. Departs in October.

b. *Destitute of mustaches. Inner webs of the first and second quills abbreviated towards the extremity; outer web of the second abbreviated. Tarsi reticulated.*

13. F. *Tinnunculus.* Kestrel, Stannel, or Wind-Hover.—Middle toe shorter than the tarsus.

Will. Orn. 50. *Sibb.* Scot. 15. *Penn.* Brit. Zool. i. 195. *Tem.* Orn. i. 29.—*W*, Cudyll coch.—Stationary and common.

Length 14, breadth 27 inches; weight 6½ ounces. Bill blue; cere and feet yellow. Back and wing-covers red, with black spots; head and rump grey. A black streak descends from the gape. Under parts pale rust colour, spotted and barred with black; thighs and vent plain. Quills 22, dusky, spotted with white. Tail grey, with a broad black bar near the end; feathers 12, slightly arched, with the two middle ones incumbent, and nearly half an inch longer than the rest. Wings, when closed, reach about three-fourths of the length of the tail. Oil-bag very small, with a tuft of yellowish feathers, dark at the base. Palate bluish, with two rows of recurved teeth. Vermiform appendages $\frac{1}{8}$th of an inch, fixed. A small cæcum about $\frac{2}{8}$ths. *Female* with the plumage, above, the same as the back; beneath paler, with indistinct spots and streaks. Tail with transverse dusky bars, and a broad one at the end. Nest placed in hollows of trees, rocks, or ruins. *Eggs* 4, dirty white, with red blotches. *Young* like the female.—Feeds on mice and beetles; and may be seen in the act of seeking for its prey, hovering stationary, at some height, in the air, with its head to windward.

14. F. *Æsalon.* Merlin.—Middle toe as long as the tarsus.

Will. Orn. 50. *Penn.* Brit. Zool. i. 200.—Merlin or Stone-Falcon, *Mont.* Orn. Dict. Suppt. *Tem.* Orn. i. 27.—*W*, Corwalch.—Near woods.—Not common.

Length 12, breadth 25 inches; weight 5½ ounces. Bill blue; cere, margin of the eye and feet lemon-yellow. Plumage, above, bluish-grey, with a longitudinal black spot on each feather; beneath, the throat is white, and the remainder yellowish-white, with oblong dusky spots pointing downwards. Quills reaching two-thirds of the tail; the first nearly equal to the fourth. Tail-feathers with bands, and an entire dark broad one tipt with white at the end. In the *female*, the plumage is tinged with brown, and the spots below are more numerous. Nest in trees or on the ground. Eggs 5 or 6; white, marked with greenish colour at one end. *Young* like the female.—Preys on small birds, and is exceedingly active.—Visits the south of England in October, but breeds in the north and in Scotland.

GEN. VII. GYRFALCO. *(Hierofalco of Cuvier.)* JERFALCON.—Notch of the bill obsolete. Tarsi reticulated.

14. *G. candicans.*—Plumage white, with dusky lines or spots.

Gyrfalco, *Will.* Orn. 44. *Sibb.* Scot. 14. *Penn.* Brit. Zool. 1. 177.—T. rusticolus and fuscus, *Fab.* Fauna Gr. 55.—Falco Islandicus, *Temm.* Orn. 1. 17.—*W*, Hebog chwyldro.—In Scotland rare; Aberdeen, *Pennant;* Orkney, *Low.*

Length 1 foot 10 inches. Bill, cere, and feet yellow, more or less tinged with blue. The dark spots on the wings are large. The throat and long thigh-feathers pure white; the rest of the plumage below white, with narrow dusky stripes. The tail, consisting of 12 feathers, has dark bands, from 12 to 14 in number, and is longer than the wings. The *female* has the dusky markings larger and more numerous on the under side. Breeds in rocks, and lays from 3 to 5 spotted eggs of the size of a ptarmigan. The young birds have the ground of the plumage dusky, edged and spotted with white, with the cere and margin of the eye bluish.—Feeds on birds, darting down upon them like an arrow.—The Spotted Falcon of Pennant, Brit. Zool. i. 189., seems to be a young bird of this species.

GEN. VIII. BALBUSARDUS, *(Pandion of Savigny)*, OSPREY.—Outer toe capable of having its position and motion reversed, and having a larger claw than the inner toe.

15. *B. Haliætus.*—Wings longer than the tail. Tarsi short, thick, and reticulated.

Balbusardus, *Will.* Orn. 37. *Sibb.* Scot. 15.—Osprey, *Penn.* Brit. Zool. i. 174.—Falco Hal. *Temm.* Orn. i. 47.—*W*, Pysg Eryr, Gwalch y weilgi; *G*, Iolair uisge.—Frequents the margins of large rivers and lakes.

Length 23, breadth 64 inches; weight 62 ounces; bill black, cere and legs blue, irides yellow. The plumage above is brown; the feathers on the head edged with white; hind head white. Below, it is white. Beneath the eye is a band of brown, reaching almost to the shoulder. Quills, about 28; those from the 17th to the base, pointed; inner webs of the four first abbreviated at the extremity. Tail of 12 equal feathers; the two middle ones dusky; the others barred with brown and white. Tibiæ long. Soles of the feet very rough. Montagu states (Sup. Orn. Dict.), that, "on the inner side of the extremity of the outer toe are two or three spines." Breeds on the ground, among reeds, or on trees. *Eggs* 3 or 4, white and elliptical. Young with the feathers on the breast yellow, with dusky or brown spots.—Feeds on fish chiefly, darting upon them in the water.

GEN. IX. MILVUS. KITE.—Tarsi plated, short.

16. *M. vulgaris.*—Plumage, above, deep brown, with pale edges; beneath, ferruginous, with dark longitudinal stripes.

Will. Orn. 41. *Sibb.* Scot. 15. *Penn.* Brit. Zool. i. 185.—Falco milvus, *Temm.* Orn. i. 59.—*W*, Barcud; *G*, Clamhan gabhlach, Cromanlochaidh.—Wooded situations, but not common.

Length 28, breadth 64 inches; weight 44 ounces. Bill yellowish, with a dusky tip; cere and irides yellow. The feathers on the head are light-coloured, with a dark streak on the shafts. Quills 24; inner webs of the first four, and outer webs of the third and fourth, abbreviated; black at the extremities. Two outer tail-feathers more produced, and darker than the others. The *female* has the brown and pale edges of the feathers more distinct, the latter passing into white. Breeds in trees, making a nest of sticks, lined with wool.

Eggs 3 or 4. In the young, the feathers of the head are more rounded, and destitute of longitudinal dark stripes.—Feeds on reptiles and dead fish. Is stationary in Britain.

◆

Sir Robert Sibbald enumerates, in his list of Scottish Birds (Scot. Ill. p. 15.), a "*Milvus niger*, a black gled. An Lanius?" This is probably the Falco ater of Gmelin and Temminck. It differs from the preceding in the head and throat, being striped with white and brown. The plumage above, deep greyish brown. The tail with nine pale bands. Bill black; irides greyish black; cere and feet yellow.

◆

The *Falco furcatus* of Linnæus, occurred to the late Dr Walker, at Ballachulish, in Argyleshire, in 1772, as recorded in his Adversaria for 1772, p. 87, and 1774, p. 153. A description of another example, taken near Hawes, in Wensley Dale, Yorkshire, was communicated to the Linnean Society, 4th November 1823, by W. Fothergill, Esq. This species belongs to the genus Elanus of Savigny. It is white, with the wings and tail black; the two exterior feathers of the latter much produced. It inhabits Carolina and Brazil, and may be regarded as a rare straggler in Europe.

GEN. X. PERNIS. HONEY-BUZZARD.—Tarsi half-feathered and reticulated.

17. *P. apivorus.*—Plumage brown above; brown and white beneath; the head grey.

Butio apivorus, *Will.* Orn. 39.—Falco ap., *Linn.* Syst. i. 130. *Penn.* Brit. Zool. i. 190. *Temm.* Orn. i. 67.—*E*, Capped Buzzard.—*W*, Bod y mel.—In England, rare.

Length 23, breadth 52 inches; weight 31 ounces. Bill, cere, gape, and claws black; irides and feet yellow. Quills 24; secondaries with alternate rays of blackish-brown and bluish-grey. Tail long, with transverse bars. In the *female*, the plumage is spotted. Breeds in trees. Eggs grey, with obscure spots. In a nest, robbed at Selborne, there was one egg smaller, and not so round as the common buzzard; dotted at each end with small red spots, and surrounded in the middle with a broad bloody zone;—White's Selb. i. 187. Young birds have the cere yellow; the head spotted with brown and white.—Feeds on bees, wasps, reptiles, and small birds.—Probably only a summer visitant.

GEN. XI. AQUILA. EAGLE.—Wings, when at rest, equal to the tail in length.

18. *A. Chrysaëtos.* Golden Eagle.—Tarsi feathered to the toes. The last joints of all the toes furnished with only three scales.

Chrysaëtos, *Will.* Orn. 27. *Sibb.* Scot. 14. *Penn.* Brit. Zool. i. 162.—Falco fulvus, *Temm.* Orn. i. 38.—*W*, Eryr melyn, Eryr tinwyn; *G*, Solair dhubh.—Inhabits mountainous districts. Breeds in Orkney.

Length 36, breadth 88 inches; weight about 12 pounds. Bill dusky; irides brown; cere and feet yellow. The acuminated feathers on the head and neck bright rust colour. The rest of the plumage dusky brown. The feathers on the thighs and legs of a light colour. Tail rounded, longer than the wings, of a deep grey, clouded with dark-brown; a band of the latter occurring at the extremity. Breeds in high precipices. Eggs 2 or 3; dusky white, with reddish blotches. The plumage of the young is darker, and the basal half of the tail is white. In this state, it is the Chrysaëtos cauda annulo albo cincta of *Will.*, 28; Falco fulvus of *Lin.* Syst. Nat. i. 125; or the Ringtail Eagle, or Black Eagle of *Pen.* Brit. Zool. i. 165. In the opinion of some, the ringtail is considered as a distinct species; but the facts stated by Temminck and Selby demonstrate its connection with the Golden Eagle.—See Wern. Mem. vol. iv. 428 and 434.—Preys on sheep and deer.

19. A. *albicilla.* The Erne.—Tarsi half feathered, and plated. Tail not longer than the wings.

Haliætus, *Will.* Orn. 29. *Sibb.* Scot. 14.—Falco ossifragus, *Linn.* Syst. i. 124.—Cinereous Eagle, *Penn.* Brit. Zool. i. 170.—Falco albicilla, *Temm.* Orn. i. 49.—*W*, Mor Eryr, Eryr Cynffonwyn; *G*, Iolair.—Near the sea-coast, not rare; whence termed Sea Eagle.

Inferior in size to the preceding. Bill whitish; irides light-brown; cere and feet yellowish-white. Plumage dusky-brown, tinged with cinereous. Tail wholly white. Breeds in rocks. Eggs two; of a white colour, with a few reddish spots. In the *young*, the plumage is deep-brown, with the margins of the feathers lighter coloured. Bill and iris black. Tail with the basal half whitish-grey, with irregular brown spots on the outer webs; the extremity brown. In this last state it is the Sea-Eagle of Pennant, Brit. Zool. i. 167.; the Haliætus and Pygargus of Willoughby; and the Vultur albicilla and F. ossifragus of Linnæus, all which belong to this species, and seem to be in intermediate stages of plumage. Feeds on fish, aquatic birds, and land animals.

The following device for catching the eagle is said, in the Statist. Account, vol. xxi. p. 221., to be successfully practised in Sutherland. The fox, it is added, is readily secured by the same snare. "A miniature house, at least the wall part of it, is built on ground frequented by the eagle, and an opening left at the foot of the wall sufficient for the egress of the bird. To the outside of this opening, a bit of strong skainy (cord) is fixed, with a noose formed on one end, and the other end returning through the noose. After all this operation is finished, a piece of carrion is thrown into the house, which the eagle finds out and perches upon. It eats voraciously; and, when it is fully satiated, it never thinks of taking its flight immediately upwards, unless disturbed, provided it can find an easier way to get out of the house; for it appears that it is not easy for it to begin its flight but in an oblique direction; consequently, it walks deliberately out at the opening left for it, and the skainy being fitly contrived and placed for the purpose, catches hold of, and fairly strangles it."

GEN. XII. CIRCUS. HEN-HARRIER.—One-third of the tail extending beyond the wings.

20. *C. cyaneus.*—The third and fourth quill-feathers of equal length.

Pygargus, *Will.* 40.—Subbuteo, *Sibb.* Scot. 15.—Hen-harrier, *Penn.* Brit. Zool. i. 193.—*Mont.* Lin. Trans. ix. 182. Orn. Dict. Suppt.—Falco cyaneus. *Tem.* Orn. i. 72.—*W*, Barcud glâs, Bod tinwyn; *G*, Ant-eun fiorm. Breid air toin.—Not uncommon.

Length 18, breadth 40 inches; weight 13 ounces; bill dark blue; cere and legs yellow; plumage grey; under and upper tail-covers, belly, and below the wings, white. Behind the nostrils, and above the eyes, numerous black hairs. The 1st quill, equal in length to the 7th; 2d and 5th nearly equal; 3d and 4th longest, and nearly equal. Inner webs of the first four, and outer webs of the 3d, 4th, and 5th abbreviated from the middle; 2d, 3d, 4th, 5th, black; 1st and 6th, greyish; rest grey. Tail, with the two middle feathers uniform; the others lighter coloured, and barred with dusky on their inner webs. The ear-feathers, forming a large concha, like a ruff on the sides of the neck, distinguish this species from the other British Accipitres. *Female*, with the plumage, above, brown, with pale margins; beneath, yellowish-brown, with longitudinal dark spots. The two middle tail feathers with dark cinereous and blackish bands. In this state, it is the Falco pygargus of Linnæus, and the Ring-tail of British ornithologists. Willoughby had hinted at their identity, Orn. p. 40.; and Barington seems to have admitted it, Phil. Trans. 1770, p. 14; but it was Montagu who removed all doubts on the subject. Breeds in furse and heath. Eggs 4 or 5, bluish white, and without spots. Young like the female. This species flies near the ground, and is very destructive to poultry and game.

GEN. XIII. BUTEO. BUZZARD.—Wings and tail long, the latter rounded.

a. *The fourth quill-feather longest.*

(a.) *Wings reaching nearly to the end of the tail.*

21. *B. vulgaris.* Common Buzzard.—Upper quarter of the tarsi feathered. Nostrils round; the margin of the upper mandible slightly waved.

Will. Orn. 38. *Sibb.* Scot. 15.—Buzzard, *Penn.* Brit. Zool. i. 188.—Falco buteo, *Temm.* i. 63.—*E*, Puttock; *W*, Bod teircail; *G*, Clamhan.—Common, near large woods.

Length 21, breadth 50 inches; weight 32 pounds. Bill bluish, cere, irides, and feet yellow. Plumage, above, deep brown, with pale margins; below, greyish-brown, with darker spots, sometimes with cross bars of white, scarcely apparent on the throat, but increasing on the breast, belly, and vent. Thighs plain dusky-brown on the outside, more rufous on the inside. The first four quills, with the inner webs abbreviated and black towards the extremity. Tail-feathers dusky, with pale tips and brown bars; a little longer than the wings. Breeds in trees. Eggs 2 or 3, size of those of a hen, white, with rusty spots at the larger end. The young have the plumage light brown, variegated with white and yellow; throat and belly white, the latter with longitudinal large spots. Feeds on rabbits and birds, pouncing its prey on the ground.

22. *B. Lagopus.* Rough-legged Buzzard.—Tarsi feathered nearly to the toes.

Rough-legged Falcon, *Penn.* Brit. Zool. ii. 623. *Mont.* Orn. Dict.—Falco Lagopus, *Temm.* i. 65.—In England, rare, *Leverian Museum;* Kent, *Dr Latham;* Suffolk, *Montagu.*

Length 19 to 27 inches. Bill and claws black; cere and feet yellow; irides brown. Head, neck, throat, breast, and thighs yellowish-white, with large streaks of brown. Back dark-brown, with yellowish margins. Belly with a large brown spot; the rest beneath yellowish-white. Quills white at the base, dusky at the ends. Tail, with the basal half, white; then a broad brown band; the tips whitish. In the female, the head, neck, and tail are whiter; the sides and belly browner. Breeds in trees. Eggs 4, clouded with red. Young have brown spots above, varied with white, with a stripe of the same colour over the eye. Tail with three bands near the end. Feeds on glires and frogs. It is frequent in the north of Europe.

(b.) *Wings much shorter than the tail. (The Accipiter of Willoughby; Astur and Nisus of Cuvier.)*

23. B. *Palumbarius.* Goshawk.—Tarsi short. A white line over the eye.

De Accipitre Palumbario, *Will.* Orn. 51.—*Sibb.* Scot 15. Goshawk, *Penn.* Brit. Zool. i. 184,—Falco, Palumbus, *Temm.* i. 55.—*W*, Hebog marthin.—Breeds in Scotland; is rare in England.

Length about 2 feet. Bill blue, tipt with black, cere yellowish green, irides and feet yellow. Plumage, above, bluish-grey; beneath, white, with transverse brown bars. Tail cinereous, with 4 or 5 dark brown bands. The female has the plumage above, with a tinge of brown; and brownish streaks on the throat. Breeds in trees, and probably rocks. Eggs 2 to 4, bluish-white, with brown spots and streaks. In the young birds, the head, neck, and belly, are rufous, with longitudinal brown spots. Tip of the tail white. These, in different stages of their plumage, have been termed Gentil Falcons. Feeds on the largest kinds of birds. It was formerly held in high esteem in hunting, and flown at cranes, geese, and big game.

24. B. *Nisus.* Sparrow-hawk.—Tarsi long. A white spot on the nape.

De Accipitre Fringillario, *Will.* Orn. 51. *Sibb.* Scot. 15.—Sparrow-hawk, *Penn.* Brit. Zool. i. 198.—Falco Nisus, *Tem.* Orn. i. 56.—*W*, Gwepia; *G*, Speir sheog.—Common.

Length 12, breadth 23 inches; weight 5 ounces. Bill black, cere, irides, and legs, yellow. The bill is sharp, and the hook on the upper mandible distinct. Plumage above, deep bluish-grey; beneath, white, with a reddish tinge, with longitudinal streaks of brown on the throat, and transverse bars on the other parts. Tail with indistinct bands. *Female* two thirds larger. Breeds in trees and old ruins. Eggs 3 to 6, dirty white, with angular reddish spots. The *Young* have the upper parts with a reddish tinge, and yellowish, or brown, beneath. Feeds on small birds, which it pursues fearlessly. Destructive to pigeons and young chickens.

b. *The third quill-feather the longest. Tarsi produced.*

25. *B. æruginosus.*—Moor Buzzard. Nostrils kidney-shaped. Wings a little shorter than the tail.

Milvus ærug. *Will.* Orn. 42. *Sibb.* Scot. 15.—Falco ærug. *Linn.* Syst. i. 130.—Moor Buzzard, *Penn.* Brit. Zool. i. 192.—Falco rufus, *Tem.* i. 69.—*S*, Bog-gled; *W*, Bod y gwerni.—Near swampy situations, not uncommon.

Length 20, breadth 50 inches; weight 21 ounces. Bill and claws black; cere and irides yellow. The upper mandible has a distinct blunt tooth. Head, neck, and breast, yellowish-white, with longitudinal brown spots; the rest of the plumage chocolate-brown, with the margins more or less ferruginous. Quills white at the base, the remainder black. Inner webs of the first four, and the outer webs of the second, third, fourth and fifth abbreviated. Breeds on the ground, rarely on trees. Eggs 3 or 4, less than those of the preceding species, and of a spotless white. Young with the plumage more uniformly brown, including the crown, chin, and breast, the yellowish-white appearing only on the hind head. Iris brownish black. Feeds like the former.

26. B. *cineraceus.* Ash-coloured Buzzard.—Wings exceed the tail in length.

Falco cinerarius, *Mont.* Orn. Dict. et Suppt. Lin. Trans. ix. 188. *Tem.* i. 76.—Breeds in England.—*Montagu.*

Length 18, breadth 44 inches; weight 9¾ ounces. Bill and claws black; the latter small. Cere greenish. Irides, and margins of the eye, and legs yellow. Plumage, above, cinereous brown; beneath, white, with a broad streak of bright bay down the shaft of each feather. Quills dusky black; the first very short, the third by far the longest. Secondaries cinereous with dusky bars. Tail with the two middle feathers dusky brown, others of an ash colour. The *female* has the head ferruginous, the nape with a patch of white, the remainder of the upper parts of the body, including the quills, dark chocolate brown, with ferruginous margins. Lower part of the rump and tail covers white. Beneath, the plumage is uniformly ferruginous. Breeds among furze. Eggs 4, white. *Young* like the female. Montagu supposes that Pennant referred to this species in his variety of the Ring-Tail, with the colour of the belly entirely plain, (Brit. Zool. i. 195.) Feeds on larks. Has probably been confounded with the Circus cyaneus, from which, however, it differs obviously in the superior length of the wings.

It is probable, that the species of this group are more numerous than they are here represented to be. But the descriptions which exist in several British works being occupied almost exclusively with colour, render the determination of the species in some cases impracticable. The migration of birds of this kind is still involved in obscurity; hence, with reference to the rarer species, the season in which they have been observed should be carefully noted, as furnishing an essential element in the determination of their physical distribution.

II. NOCTURNAL RAPACIOUS BIRDS.

GEN. XIV. OTUS. HORN-OWL.—Tarsi and Toes closely feathered. The second quil-feather longest.

27. O. *vulgaris.* Long Horn-Owl.—Horns consisting of from six to ten feathers.

Otus sive Noctua aurita, *Will.* Orn. 64. *Sibb.* Scot. 15.—Long-eared Owl, *Penn.* Brit. Zool. i. 203.—Strix Otus, *Temm.* Orn. i. 102.—*W*, Dylluan gorniog.—Frequents extensive woods.

Length 14½, breadth 40 inches; weight 10 ounces. Bill and claws black, irides reddish. Plumage, above yellowish-brown, with dusky streaks, and freckled with grey and white; beneath, dull yellow, with oblong brown spots. Horns about an inch long, of black feathers, with the margins brown and white. Willoughby and Montagu state the number of feathers at 6, Temminck at 10. The *female* has a white throat, the whole plumage tinged with greyish-white. Breeds in evergreen trees or old nests of crows. Eggs 4 or 5, of a white colour. The *young* are of a whitish-red, with transverse black lines. Tail and wings grey, with brown points. Feeds on mice and small birds, at night. Does not migrate.

28. O. *brachyotus.* Short Horn-Owl.—Horns of three feathers.

Short-eared Owl, *Penn.* Brit. Zool. i. 204.—Strix brachyotus, *Temm.* Orn. i. 99.—*E*, Mouse-hawk, Woodcock-owl, Hawk-owl; *W*, Dylluan glustiog.—Breeds in Orkney.—A winter visitant in other districts.

Length 14, breadth 37 inches; weight 14½ ounces. Bill and claws black; irides yellow. The plumage, above, is dusky, with pale ferruginous edges: beneath, yellow on the upper part, white on the belly, with long dusky stripes. Quills 25. The two first pointed, the rest rounded. Inner web of the first and second, and outer web of the second, abbreviated near the tip. Tail, with brown and yellow bars. Female higher coloured. M. Cuvier (Regne Animal, i. 328.), states, that the females are destitute of horns. Bewick (British Birds, 1. 49.), on the contrary, says, "Of several of these birds, both male and female, which we have been favoured with by our friends, we have observed that both had the upright tufts or ears." Breeds in heaths. Mr Low, who observed the nest in Hoy (Faun. Orc. 42.), found two young ones.

They have the face dark coloured. This owl pursues, in dark weather, pigeons, moorfowl, and plovers. Feeds likewise on mice and small birds. From the testimony of Mr Low, it breeds in Orkney, but, in the middle districts of Scotland and England, it appears in harvest, and departs in spring, frequenting stubble-fields and long grass. When disturbed it flies but to a short distance.

GEN. XV. ALUCO. BARN-OWL.—Lower part of the tarsi and toes thinly clothed with white hairs.

29. A. *flammeus.*—Bill white, claws dusky.

A. minor, *Will.* Orn. 66. *Sibb.* Scott. 15.—White Owl, *Penn.* i. 206.—Strix flammea, *Temm.* Orn. i. 91.—Church-Owl, Hissing-Owl, Screech-Owl.—*W*, Dylluan wen; *G*, Cailleach-ordhche gheal.—Near houses and old ruins.—Common.

Length 14, breadth 36 inches; weight 12 ounces. Plumage, above, pale yellowish-brown, with interrupted streaks of dusky and grey, and dusky freckles. Beneath white. First and second quill-feathers of equal length. Webs not abbreviated. This species breeds in steeples and old ruins, or trees. Eggs, 3 or 4, of a white colour. Young, easily tamed. Feeds on mice, and is useful about barns. Devours the shrew. Makes a noise by hissing and snapping its bill. Resides throughout the year.

GEN. XVI. BUBO. EAGLE-OWL.—Toes closely covered with feathers.

30. B. *maximus.*—Second and third quill-feathers longest.

Bubo, *Will.* Orn. 63.—B. max, *Sibb.* Scot. 15. Eagle-Owl, *Penn.* Brit. Zool. i. 202.—*Neill's* Tour in Orkney, p. 195.—Strix bubo, (*Linn.*) *Temm.* i. 100.—*W*, y Ddylluan fawr.—In England and Scotland, rare.

Length 2 feet, bill and claws dusky; irides orange. Plumage above, waved with black and yellow; beneath yellow, with black stripes. Throat white, a character peculiar to the male. Breeds in rocks. Eggs 3, round and white. It occurs in Orkney, where it preys, according to Mr Neill, on rabbits and moorfowl. It has been shot in different places of England, but may be considered rare, and probably nothing more than a straggler.

GEN. XVII. SCOPS.—Feet naked.

31. S. *Aldrovandi.*—Bill black, irides yellow.

Will. Orn. 65.—Little Horned-Owl, *Mont.* Orn. Dict. Supp.—Strix Scops, *Temm.* Orn. i. 103.—Yorkshire, Mr Fothergill; and Mr Folgamble. Rare.

Length 7½ inches. Plumage variegated with dusky, rufous, brown and grey; the brown predominating above the grey beneath. Quills transversely barred with rufous-white. Feathers on the legs rufous-grey. Tarsi and claws brown. Horns and head brown, with black dots. Breeds in rocks. Eggs 2 to 4, of a white colour. Though not uncommon on the Continent of Europe, it must be regarded as little else than a straggler in Britain.

GEN. XVIII. STRIX.—Feet closely feathered.

32. S. *stridula.* Ivy-Owl.—Bill pale horn-coloured, irides and claws dusky.

Strix, *Will.* Orn. 65. *Sibb.* Scott. 15.—Tawny Owl and Brown Owl, *Penn.* Brit. Zool. i. 208.—Strix stridula, *Linn.* Syst. i. 133.—S. aluco, *Temm.* Orn. i. 89.—Screech-Owl, Brown-Owl, Wood-Owl.—*W*, Dylluan frech, Aderyn-y-Cyrph ; *G*, Cumhachag, Cail leach oidcho.—Near woods and houses, not uncommon.

Length 14, breadth 33 inches ; weight 12 ounces. Plumage reddish-brown, with black, striped, and mottled with dusky, with some white spots on the auricles, scapulars, and wing-coverts. Quills and tail barred with reddish-brown and black ; first, second, third, fourth and fifth quills with the inner margin abbreviated ; a slight concavity in the margin of the outer web of the second, third, and fourth. In the *female* the plumage is of a redder colour. Breeds in old trees. Eggs 2 or 3, of a dull white. Feeds on young hares, pigeons, and mice.

33. S. *nyctea.* Snowy-Owl.—Bill and claws black, irides yellow.

Lin. Syst. i. 132. *Bullock*, Lin. Trans. xi. 175. *Edmonstone*, Wern. Mem. iv. 157. *Temm.* Orn. i. 82.—Inhabits Zetland.

Length 2 feet, breadth 5 feet 5 inches. Plumage white, with transverse streaks of brown or dusky. In old birds, the plumage is wholly white ; in the young, the spots and bars are more numerous. Tail rounded, about the length of the wings. Supposed to breed in Zetland and Orkney. According to Mr Edmonstone, it rests generally beneath some stony projection, which protects it from the direct influence of the sun. Frequents solitary elevated places. Preys chiefly on sandpipers and mice. Hoots when irritated, like the preceding species.

34. S. *passerina.* Little Owl.—Bill and claws brown, tip of the former yellow ; irides yellow.

Noctua minor, *Will.* Orn. 69.—Strix pass. *Linn.* Syst. i. 133. *Penn.* Brit. Zool. i. 211. *Temm.* Orn. i. 92.—*W*, Coeg Ddylluan.—In England, rare.

Length 7, breadth 14 inches. Plumage, above, greyish-brown, with white spots ; breast white ; remainder, below, reddish-white, with cinereous brown spots. The female has reddish spots on the neck. Breeds in holes in old walls. Eggs 2 or 4, rounded, white. Feeds on mice and small birds.—It is uncertain whether this species breeds in England, or is only an occasional visitant.

PASSERES.

I. *The first joints of the outer and middle toes connected by membranes.*

* *Gape remarkably large. Bill wide at the base ; a little hooked at the point.* Fissirostres.

† Nostrils open. Wings long, flight rapid.
Hirundo.
Cypselus.

†† Nostrils tubulur.
Caprimulgus.

** *Gape of the ordinary size.*

† Upper mandible with a notch in the margin. Dentirostres.

1. Upper mandible hooked at the extremity. Notch well marked.
  - *a.* Bill compressed; ridge of the bill arched and rounded.
    - Lanius.
  - *aa.* Bill depressed.
    - *b.* Bill at the base with numerous long stout hairs.
      - Muscicapa.
    - *bb.* Bill with tender short hairs.
      - Bombycilla.

2. Upper mandible without a hook at the end. Notch less distinct.
  - *a.* Bill compressed. First feather in the wing very short.
    - *b.* Tail long.
      - *c.* Tarsus longer than the middle toe.
        - Turdus.
        - Pastor.
      - *cc.* Tarsus shorter than the middle toe.
        - Oriolus.
    - *bb.* Tail short.
      - Cinclus.
  - *aa.* Bill subulate, slender, slightly depressed at the base.
    - *b.* Bill a little enlarged at the base. Legs long.
      - Saxicola.
      - Sylvia.
    - *bb.* Bill slender throughout.
      - *c.* Hind claw of ordinary size.
        - *d.* Bill uniformly convex at the sides.
          - Curruca.
          - Accentor.
        - *dd.* Bill approaching to concave at the sides.
          - Regulus.
          - Troglodytis.
      - *cc.* Hind claw produced.
        - *d.* Tail and scapulars produced.
          - Motacilla.
        - *dd.* Tail and scapulars common.
          - Anthus.

†† Upper mandible wanting the terminal notch.

1. Bill strong, and of a conical form. CONIROSTRES.
  - *a.* Mandibles crossing at the extremity.
    - Loxia.
    - Corythus.
  - *aa.* Mandibles acting in opposition.
    - *b.* Ridge of the upper mandible nearly straight.
      - *c.* Palate with a tubercle.
        - Emberiza.
      - *cc.* Palate plain.
        - *d.* Hind toe produced, and nearly straight.
          - Alauda.
        - *dd.* Hind toe of ordinary dimensions.
          - *e.* Base of the bill with numerous hairs.
            - Parus.
          - *ee.* Base of the bill plain.

f. Commissure of the bill straight.
  g. Bill angular, slender, pointed.
    Sitta.
  gg. Bill strong and rounded.
    h. Bill more or less inflated at the base.
      Pyrrhula.
      Coccothraustes.
      Pyrgita.
    hh. Bill exactly conical
      Fringilla.
ff. Commissure of the bill interrupted.
  Sturnus.

bb. Ridge of the upper mandible obviously curved.—Nostrils covered with defluted feathers.
  c. Feathers of the front loose, and capable of being erected into a crest.
    Garrulus.
  cc. Front feathers plain.
    d. Tail produced.
      Pica.
    dd. Tail of ordinary size.
      Corvus.

1. Bill slender, produced. TENUIROSTRES.
  a. Claws long and hooked, for climbing trees.
    Certhia.
  aa. Claws of ordinary dimensions.
    Pyrrhocorax.
    Upupa.

II. *First and second toes adhering nearly to their extremity.*
  Alcedo.

GEN. XIX. HIRUNDO. SWALLOW.—The first quill the longest. Tail forked, of twelve feathers. Nostrils partly closed by a membrane, and covered with feathers. One of the toes behind. All the species are common summer visitants.

35. H. *rustica.* The Swallow.—Front and chin chesnut-red.

H. domestica, *Will.* Orn. 155. *Sibb.* Scot. 17.—H. rus. *Linn.* Syst. i. 343. *White*, Phil. Trans. 1775. 258.—Chimney-Swallow, *Penn.* Brit. Zool. i. 398.—*Temm.* Orn. i. 427.—*W*, Gwennol, Gwenfol; *G*, Gobhlangaoith.

Length 7, breadth 12 inches; weight 1 ounce. Bill black, irides hazel, tongue and palate yellowish. Legs and feet dusky. Forehead and chin chesnut-red. Plumage, above, black, with a gloss of purple; beneath, with the breast black, the rest dusky white. Two middle tail-feathers plain, the rest marked on the inner webs, near the ends, with an oval white spot. In the *female*, the tail-feathers are much shorter, there is less red on the front, and more white beneath. The nest is in chimneys, or in out-houses, upon or against the rafters, composed of clay on the outside, with grass and feathers within, and open above. *Eggs* from 4 to 6 in number, white, with red specks. Frequently brings out two broods in the season. This species visits us earlier than its congeners. Drinks and washes on the wing. Albinoes sometimes occur.

26. H. *urbica.* The Martin.—Above black; beneath and rump white.

H. agrestis, *Will.* Orn. 155.—House-Martin, *White*, Phil. Trans. 1774, 196. *Penn.* Brit. Zool. i. 401.—H. urb. *Temm.* Orn. i. 428.—*W*, Marthin Penbwl.

Length 6, breadth 10½ inches. Bill black; irides hazel; claws white; legs and toes closely covered with white down. The black of the head and back glossed with purple. The *female* has the white of the throat inclining to dusky. *Nest* of similar materials to the rustica, but in this it is covered at top, with a lateral entrance. It is placed against the eaves of houses or the sheltered corners of windows. *Eggs* four or five; white. In this species the tail and wings are shorter than the swallow, and its motions less quick. Albinoes sometimes occur.

36. H. *riparia.* Sand-Martin.—Plumage above, and the breast, mouse coloured; the rest white.

Will. Orn. 156. *Sibb.* Scot. 17. *White*, Phil. Trans. 1775, 272. *Penn.* Brit. Zool. i. 402. *Temm.* Orn. i. 429.—*E*, Shore Bird; *W*, Gennol-y-Glennydd; *G*, Gobhlan gainbhich.

Length 5½ inches. Bill and legs dusky; irides hazel. Tarsi with a few small feathers at the insertion of the hind toe. The *female* has duller colours. *Nest* at the extremity of horizontal holes, in sand-banks, 2 or 3 feet in length, consisting of grass and feathers. *Eggs* from 4 to 6, of a white colour. The *young* have the feathers bordered with rust colour.—This species in flight is irregular, making sudden jerks.

GEN. XX. CYPSELUS. SWIFT.—Tail forked; of 10 feathers. All the toes pointing forward. The first quill a little shorter than the second. Nostrils near the ridge of the bill, exposed, lengthened, with elevated margins.

37. C. *Apus.* Common Swift.—Plumage black, with a white chin.

Hirundo Apus, *Will.* Orn. 156. *Sibb.* Scot. 17. *White*, Phil. Trans. 1775, 264. *Penn.* Brit. Zool. i. 403.—C. murarius, *Temm.* i. 434.—*E*, Black Martin, Screech; W, Marthin du.

Length 8, breadth 18 inches; weight above an ounce. Bill, legs, and toes, black; irides dark hazel. Breeds in holes in towers and steeples. *Nest* of grass and feathers. *Eggs* 2, of a white colour. The *young* have the feathers at the base of the bill white; the quills, their covers and tail-feathers bordered with white. Copulate on wing. Breed only once in the season. Depart early.

GEN. XXI. CAPRIMULGUS. GOATSUCKER.—Tail rounded, of 10 feathers. Three toes in front, united at the base to the first joint; hind-toe capable of being brought forward. Nostrils tubular. Bill with stiff hairs at the base. Middle claw serrated. The second quill longest.

38. C. *Europeus.* European Goatsucker.—Plumage ash-coloured, much freckled with black, white, and brown.

Will. Orn. 70. *Penn.* Brit. Zool. i. 416. *Temm.* Orn. i. 436.—*E*, Night Hawk, Dor-hawk, Fern Owl, Church Owl, Night Garr, Wheel Bird, Goat Owl.—A summer visitant. Near woods.

Length about 10 inches; weight 3 ounces. Bill weak, black. Legs scaly, feathered below the knee. Eyes large. Irides dusky. A large white oval spot on the inner web of the three first quills, and at the end of the two lateral tail feathers of the male only. Makes no nest, but lays its two eggs, which are white, marbled with brown, on the ground among fern or grass. Feeds on moths and beetles. Visits this country in May and departs in August. Makes a singular noise, like a spinning-wheel; hence called in Wales *Aderyn-y-droell*, or the Wheel Bird. It has long been charged with sucking the teats of goats, an operation for which it is disqualified by the form of its bill.

GEN. XXII. LANIUS. SHRIKE.—Toes entirely divided. Tarsus longer than the middle toe. The third and fourth quills the longest. Bill with strong hairs pointing forwards.

39. L. *Excubitor.* Cinereous Shrike. — Head, neck and back cinereous, with a black band under the eyes.

Lanius *Merret's* Pin. 170.—Lan. cin. major, *Will.* Orn. 53.—L. Ex. *Linn.* Syst. i. 135.—Great Shrike, *Penn.* Brit. Zool. i. 213.—L. Ex. *Temm.* Orn. i. 142.; *E*, Wierangel, Mattagasse; *W*, Cigydd mawr.—Inhabits woods.

Length 10, breadth 14 inches; weight above 2 ounces. Bill and legs black. The black band of the eyes reaches the ear covers. Plumage, beneath, white. Wings black; the roots of the primaries and tips of the secondaries white. Two middle tail-feathers black, the two lateral ones white. The *female* chiefly differs in the dingy colour of her white beneath, with her feathers marked with brown crescents. *Nest* in bushes. *Eggs* 6 or 7; white, with brown spots. *Young* like the female. The food consists of mice, small birds and reptiles, which are sometimes stuck on a thorn, and pulled to pieces before being devoured.—It remains to be determined whether this species breeds in Britain. It is occasionally found in the beginning of Winter.

40. L. *Collurio.* Red-backed Shrike.—The back, scapulars, and wing covers, ferruginous.

L. tertius, *Will.* Orn. 54.—L. Col. *Linn.* Syst. i. 136. *Penn.* Brit. Zool. i. 215. *Temm.* Orn. i. 147.—*E*, Flusher; *W*, Agydd cefn-goch.—A summer visitant of England.

Length 7, breadth 12 inches; weight about 2 ounces. Bill and legs black. Forehead, through the eyes to the ears, black. Head, neck, and rump grey. Wings dusky, slightly edged with brown. Plumage, beneath, rose-coloured, inclining to white on the throat and vent. The two middle tail-feathers black, the others two-thirds white, then black, slightly tipped with white. In the *female* the plumage has more red above and white beneath. The 4 middle tail-feathers brown. Builds, in hedges, a nest of moss lined with hair. Eggs 5 or 6, variable in colour. *Young* like the female. Its principal food is insects. Breeds in the southern counties of England. Arrives in May and departs in September.

Since the days of Willoughby the *Wood Shrike* (Lanius an minor primus, *Will.* Orn. 54.—Wood Chat, *Penn.* Brit. Zool. i. 217.—Lanius rufus, *Tem.* Orn. i. 146.) has been enumerated among the birds of Britain, though that author gives no indication of its habitat; and even states (p. 18.), that it had no English name. No succeeding observers have detected a native example, so that it no longer seems to merit a place among British Birds. It differs from the preceding species in the nape and neck being bay, the back and wings black, the rump grey, the scapulars white. The plumage, beneath, white.

GEN. XXIII. MUSCICAPA. FLYCATCHER.—Bill angular, the base and nostrils armed with bristles. The first quill short, the third and fourth the longest. Hind claw much bent.

41. M. *atricapilla.* Pied Flycatcher.—Plumage, above, black, front and beneath white.

Goldfinch, *Will.* Orn. 170.—M. at. *Linn.* Syst. i. 326.—Piedfinch, *Penn.* Brit. Zool. i. 351.—*W.* Clochder y mynydd.—Inhabits the northern counties of England. Feeds on insects.

Length about 5 inches. Wings black, with the middle and greater covers white; the extremity of the inner webs of the latter black. Tail black. In the *female* the white front is wanting; the plumage, above, is greyish-brown, and the *three* lateral tail-feathers bordered with white. The *nest* is in a hole of a tree, consisting of a few leaves, fibres and hair. The *eggs* are 5 or 6 in number, of a pale blue colour. The *young* are of a greyish colour. The quills are black. In the young male of the first year the margins of the two lateral tail-feathers are white. In the second year, the margins of the outer only is white, and by the third year the whole white disappears. Montagu is inclined to consider this species as stationary. A nest was sent him from Yorkshire by the Reverend Mr Dalton, taken in the beginning of May. Few of our early breeders are migratory.

The species now described is the *M. luctuosa* of Tem. Orn. i. 155. Another species, confounded with "*atricapilla*," he describes under *M. albicollis*, ib. i. 153. In this last, the plumage, including the head, cheeks, back, lesser wing-covers, and tail-feathers, is black. The front, a ring round the neck, and all beneath white. Rump tinged with white. Base of the quills white. The middle and greater wing-covers white, with the extremities of the inner webs of the latter black. In the female, the spot in front is small, and greyish-white. The plumage above is cinereous, except the great wing-covers, which are white, and the *two* lateral tail-feathers, which are edged with white. The collar is greyish. Nest as the preceding, but the eggs, which are bluish, have brown spots at the larger end. It is probable, that the M. albicollis should rank among British birds; the descriptions of our ornithologists justifying the conjecture, but still leaving the subject in doubt.

42. *M. Grisola.* Spotted Flycatcher.—Plumage above, brown. Head, and sides of the neck, with longitudinal brown spots.

Stoparola, *Will.* Orn. 159. *Sibb.* Scot. 17.—Spotted F., *Penn.* Brit. Zool. i. 350.—M. gris. *Temm.* Orn. i. 152.—*E*, Rafter, Bee-bird, Cherrysucker, Chanchider; *W*, Y Gwybedog.—A summer visitant of England; rare in Scotland.

The length nearly 6 inches. The inside of the mouth is yellow. Plumage beneath, dull white; the shafts of the breast feathers, dusky. Builds in orchards, or in outbuildings. Nest of moss. Eggs five, bluish white, with rusty spots.—It is, in a great measure, mute, and familiar. It disappears in September.

GEN. XXIV. BOMBYCILLA, *(Brisson)*. CHATTERER.—Bill rounded; the base and nostrils covered with hairs. The first and second quill-feathers the longest.

43. *B. Garrula.* Bohemian Chatterer.—Shafts of the secondary quill-feathers enlarged at the end into a thin red horny process.

Garrulus Bohemicus, *Will.* Orn. 90.—Ampelis Gar. *Linn.* Syst. i. 297.—Waxen Chatterer, *Penn.* Brit. Zool. i. 314.—Bombycivora Gar., *Temm.* i. 124.—*W*, Sidangynffon.—Winter visitant.

Length 8 inches. Bill and toes black. Irides vermilion red. Feathers of the head forming a produced tuft. Plumage reddish ash. A band over the eyes and the throat black. Quills black, terminating with a triangular patch of yellow and white; 8 or 9 of the secondaries with the red tips. Tail black, tipped with yellow; the inner covers chesnut. In the *female*, the black of the throat is less, and the extremities of only four or five of the secondaries are produced. Said to nestle in holes in rocks. *Young* destitute of the enlargement of the shaft of the secondaries. Feeds on insects and berries.

This species visits Scotland and England in the winter season; but its motions are irregular, being in some seasons very abundant, in others rare.

GEN. XXV. TURDUS. THRUSH.—Base of the bill with single stiff hairs. Nostrils in part covered with a naked membrane. Food, berries, insects, and snails.

a. *Ground colour of the plumage, brown and spotted.*

44. *T. viscivorus.* Missel-Thrush.—Space between the eye and bill, grey. Secondaries and wing-covers edged with white. Tail dusky; the three outer feathers greyish-white at the ends.

Will. Orn. 137. *Sibb.* Scot. 17. *Penn.* Brit. Zool. i. 301. *Temm.* Orn. i. 161.—*E*, Throstle Cock, Shrite, Holm Thrush, Misselto Thrush; *S*, Shreitch; *W*, Tresglen, Pen y Llwŷn.—Resident near woods.

Length 11, breadth 18 inches; weight 5 ounces. Bill dusky; yellowish at the base of the lower mandible. Legs yellowish. Plumage above, hair-brown; beneath yellowish-white, with triangular or rounded spots of dusky. The plumage in the *female* is more rufous beneath. Builds its nest in old trees, of lichens, lined with wool. Eggs four to six in number, of a flesh-colour, marked with deep and light rust-coloured spots. This bird varies considerably in plumage, especially in the proportion of white and red colours.

45. *T. musicus.* Common Thrush.—Space between the bill and the eye yellow; under the wing yellowish.

T. simpliciter dictus, *Will.* Orn. 138. *Sibb.* Scot. 17.—Throstle, *Penn.* Brit. Zool. i. 306.—Turdus musicus, *Temm.* Orn. 1164.—*S*, Mavis; *W*, Aderyn bronfraith; *G*, Smeorach.—Resident in woods and gardens.

Length 9, breadth 14 inches; weight 3 ounces. Bill black, yellowish at the base; mouth yellow; legs yellow; claws black. Plumage, above, greenish-brown; beneath, reddish-white, with rounded black spots. Ends of the first wing-covers yellowish, a character scarcely obvious in the female. Nest in hedges and low shrubs, composed of dry grass, plastered on the inside with clay. Eggs 5; blue, with black spots at the larger end. Subject to vary in plumage.

46. *T. iliacus.* Redwing Thrush.—Space between the bill and eye, black and yellow; under the wing, red.

> *Will.* Orn. 139. *Sibb.* Scot. 17.—Redwing, *Penn.* Brit. Zool. i. 307.—T. iliacus, *Temm.* Orn. i. 163.—*E*, Swinepipe, Wind Thrush; *W*, Soccen yr cira, y dresclen goch.—Common winter visitant. Breeds in Harris.

Length 8, breadth 15 inches; weight 2½ ounces. Bill black, base yellow. Mouth yellow; legs yellow; the claws black. Plumage, above, greenish-brown; beneath white, with lengthened brownish spots. A white line above the eye. In the *female*, the red under the wings is paler, and the dusky spots of the belly more extended. Nest in trees. Eggs six, bluish-green, spotted with black. Mr Bullock, in a letter to me, dated 23d April 1819, mentioned the circumstance of its breeding in Harris, where he had observed it in the preceding summer.

47. *T. pilaris.* Fieldfare Thrush.—Space between the bill and the eye, black. Tail black; the outer feather bordered with grey at the end.

> *Will.* Orn. 138. *Sibb.* Scot. 17. *Penn.* Brit. Zool. i. 304. *Temm.* Orn. i. 163.—*S*, Feltifer; *W*, Caseg y ddryccin; *G*, Liatriusg.—Common winter visitant.

Length 10, breadth 17 inches; weight 4 ounces. Bill yellow; dusky at the end. Legs and feet dusky. Head, neck, and rump, ash-coloured, the first with black spots. Back, shoulders, and wing-covers, chesnut. Throat and breast, reddish-yellow, with lengthened spots. Belly white. In the *female*, the head has a brownish tinge. Breeds in the north of Europe, in high trees. Eggs 4 to 6, of a sea-green colour, with red dots.

b. *Ground colour of the plumage black.*

48. *T. Merula.* Blackbird.—Plumage uniformly black.

> Merula vulgaris, *Will.* Orn. 140. *Sibb.* Scot. 17. Tur. Mer. *Penn.* Brit. Zool. i. 308. *Temm.* Orn. i. 168; *W*, Mwyalch, Aderyn du; *G*, Lon dubh. —Resident near woods and gardens.

Length 11 inches; weight 4 ounces. Bill, inside of the mouth, and tarsus of the eye, yellow. Irides and feet black. The fourth feather in the wing longest. *Female*, brownish; beneath, dirty brownish white, with dusky spots; the bill and feet brownish. Nest like the throstle. Eggs 4 or 6 in number; light-blue, with brownish spots.—*Young* like the female.

49. *T. torquatus.* Ring Thrush.—Plumage black, bordered with grey; a semilunar white spot on the breast.

> Merula torq., *Will.* Orn. 143. *Sibb.* Scot. 17.—Ring ousel, *Penn.* Brit. Zool. i. 310. *Temm.* Orn. i. 166.—*E*, Rock or mountain ousel, Michaelmas blackbird; *W*, Mwyalchen y graig; *G*, Dubh chraige.—A regular summer visitant.

Length 10½, breadth 16 inches. Bill black. Mouth, gape, and tarsus, yellow. Iris chesnut. The third feather in the wing longest. In the *female* the grey prevails more on the margins of the feathers, and the limits of the white spot on the breast are ill defined, the plumage beneath inclining more to grey, with a tinge of red. Nest on the ground, among heath. Eggs 4 to 6, greenish-white, with brown spots. In the *young*, the breast spot is indistinct. This species breeds in several places in Scotland. It is not rare in the Pentland Hills, near Edinburgh. Congregates in autumn, before departing for the south.

GEN. XXVI. PASTOR.—Base of the bill destitute of single stiff hairs. Nostrils, in part, covered with a feathered membrane.

50. *P. roseus.* Rose-coloured Ousel.—Head with a crest of feathers.

Penn. Brit. Zool. ii. 627. *Temm.* Orn. i. 136.—An irregular visitant.

Length 8 inches. Upper mandible, and the tip of the lower, of a yellowish rose-colour; the rest black. Feet yellow. Irides brown. Head, neck, and breast black, with a gloss of violet. Belly and back rose coloured. Wings and tail brown, with a violet gloss. Under tail-covers and thighs, black, with white rays. Head of the *female* plain, and the colours less bright. Nest in the holes of trees and in walls. *Young*, above, are of an Isabella brown colour. This species visits Britain irregularly. It was first recorded by Mr Edwards, who found it near London, and at Norfolk. Dr Pulteney (Dorsetshire, p. 11.), mentions it as having been found at Long Critchel. Montagu states, that about Ormskirk, at Lancashire, it occurs almost every season. In Scotland, it has occurred in Dunkeld (Stat. Ac. xx. 439), and Mr Bullock informed me, that he received it from Hoy, in Orkney, where it was shot in the garden of the Reverend Mr Hamilton. I have seen a specimen from Ireland, in the possession of N. A. Vigors, Esq. Chelsea.

GEN. XXVII. ORIOLUS. ORIOLE.—Upper mandible with a ridge. Nostrils naked, opening longitudinally in an extended membranaceous space.

51. *O. Galbula.* Golden Oriole.—Plumage of a golden yellow colour.

Penn. Brit. Zool. ii. 626. *Temm.* Orn. i. 129.—An irregular visitant.

Length 10 inches. Space between the bill and eye, the wings and tail, black; the ends of the last yellow. Bill and irides red. Feet bluish. The colour of the *female* inclines to olive-green on the back; and grey, with a tinge of yellow beneath, with dusky streaks. Nest suspended from trees. Eggs 4 or 5; white, with a few solitary spots of brown or black. *Young* like the female, but the spots beneath more numerous. This bird was first recorded by Pennant, as having been killed in South Wales. It has likewise been found in Cornwall. In 1807, two examples were killed in Scotland, the first in the spring, at Loch Ransa, in Arran, which I saw; the latter in the beginning of winter, at Restalrig, near Edinburgh. According to Mr Wood, one was shot, in company with blackbirds, 26th April 1824, at Aldershot, in Hampshire,—Annals of Phil. July 1824, p. 63.

GEN. XXVIII. CINCLUS. DIPPER.—Ridge of the upper mandible slightly concave in front of the nostrils, which are linear. No stiff hairs at the gape.

52. *C. aquaticus.*—Bill black. Irides grey. Feet yellowish.

Merula aquatica, *Will.* Orn. 104. *Sibb.* Scot. 22.—Water Ousel, *Penn.* Brit. Zool. i. 312. *Temm.* Orn. i. 176.—*S*, Water-Craw; *W*, Mwyalchen y dwfr.; *G*, Gobha uisge.—Resident near rivulets.

Length 9, breadth 12½ inches; weight 2½ ounces. Plumage above, black; the margin of the feathers on the back inclining to grey, and the head and neck with a brown tinge. Throat, breast, and upper belly, white, followed by a red space; the remainder underneath, black. In the *female*, the head and neck are cinereous brown; there is less white on the breast, and the remainder beneath, is yellowish-red. Nest on the ground, in a mossy bank, lined with leaves. Eggs 5 or 6, of a transparent white colour. *Young*, with the head and neck greyish; the wing-feathers edged with white; the whole belly is whitish. Feeds on aquatic insects, which it pursues even under water. Capable of diving, and running along the bottom of pools, by the use of its wings. It is subject to considerable variations of colour, especially in the proportions of brown and white.

GEN. XXIX. SAXICOLA. CHAT.—Bill enlarged at the base; its breadth exceeding its height. Stiff hairs at the base of the bill. Mouth black.

53. *S. Oenanthe.* Fallow-chat.—Plumage above grey; the front, throat, and band above the eyes, white.

Oenanthe, *Will.* Orn. 168. *Sibb.* Scot. 18. *Penn.* Brit. Zool. i. 383. *Temm.* Orn. i. 237.—*E*, Wheat-ear, Fallow-smich, White-tail, Chickell; *S*, Stane-chatter or chacker; *W*, Tinwyn y cerrig; *G*, Cloichearan.—A regular summer visitant.

Length 6½ inches; weight 6 drams. Bill, legs, and claws black. Irides hazel. A black stripe passes from the base of the bill, through the eye, to the ear-covers. Wings black. Two middle tail-feathers black; the rest tipt with black, and white at the base. Plumage, beneath, white, with a slight tinge of red on the neck. *Female*, with the cinereous plumage, above, mixed with brown, and the white in front inclining to dusky. Nest of dried stalks, lined with wool, placed in a hole in the ground, or among stones. The eggs, 5 or 6 in number, are of an uniform blue colour. The *young* have the plumage above, varied with red, and cinereous, and spotted with brown. This species varies in size and markings. It arrives in March, and departs in September. It is prized at table, and is captured by a noose of horse-hair.

54. *S. rubetra.* Whinchat.—Crown of the head, sides of the neck, and on the body above, blackish brown; the margins of the feathers pale.

Oenanthe secunda, *Will.* Orn. 168. *Penn.* Brit. Zool. i. 385. *Temm.* Orn. i. 244.—*S*, Whin-ckacker; *W*, Clochder yr eithen.—A regular summer visitant.

Length 5 inches; weight 4 drams. Bill, legs, and claws black. Irides dark hazel. A white streak passes from the bill over the eye to the nape, and another from the chin down each side of the neck. Front of the neck and breast ferruginous. Belly and under tail-covers, white. A white patch on the wing. Quills dusky black. Tail, with the basal half white; the rest dusky. In the *female*, the white is less in quantity, and has a reddish tinge. The nest is placed on the ground, among grass, at the root of a bush, and consists of dried stalks, lined with fine grass. Eggs 6, uniformly blue. The *young* are spotted white and grey. This species arrives in April. Frequents broom and furze, perching upon the highest twigs, where it occasionally sings very sweetly.

55. *S. rubicola.* Stone-chat.—Head, throat, and tail, black. The sides of the neck, rump, and belly, white.

Oenanthe nostra tertia, *Will.* Orn. 169. *Penn.* Brit. Zool. i. 386. *Temm.* Orn. i. 244.—*E*, Stonesmich, Moor-titling, Blacky-top; *W*, Clochder y cerrig.—Resident in England.

Length 5¼ inches; weight 5 drams. Bill and legs black. Irides dusky. Plumage on the back, and quills, black, edged with tawny. Wing-covers near the shoulder, white. Breast deep rust colour. In the *female*, the black on the throat is spotted with white and red, and the black part inclines to dusky or red. The white is less extended. The nest, at the base of a bush of furze, is composed of moss and bent, lined with hair. Eggs 5, of a blue colour, with rufous spots at the larger end, sometimes obscure. The *young* resemble the female. The males of the first year have the head brown. This species has nearly the same habits as the preceding, except that it is stationary, and does not extend so far to the north.

GEN. XXX. SYLVIA.—Bill enlarged at the base, its breadth being nearly equal to its height.

56. *S. rubecula.* Redbreast.—Greyish-brown above. Throat and breast red. Belly white.

Rubecula, *Will.* Orn. 160. *Sibb.* Scot. 18. *Penn.* Brit. Zool. i. 372.—*Temm.* Orn. i. 215.—*E*, and *S*, Robin Redbreast, Ruddoch; *W*, Yr Hobigoch Brongoch; *G*, Broinn dearg.—Common near woods and gardens.

Length 6, breadth 9 inches; weight half an ounce. Irides dark umber brown. The nest consists of dried leaves and fibres mixed with green moss, lined with hair, placed in some bank or wall. Eggs from 5 to 7, whitish, with rusty and cinereous spots. The *young* are freckled at first. This species lives in woods and retired places, in summer; during winter, it familiarly approaches the habitations of men, and in all places is a great favourite.

57. *S. Phœnicurus.* Redstart.—Bluish-grey above. Throat black. Breast, rump, and lateral tail-feathers, red.

Ruticilla, *Will.* Orn. 159. *Sibb.* Scot. 18. *Penn.* Brit. Zool. i. 371. *Temm.* Orn. i. 220.—*W*, Rhonell goch; *G*, Ceann dearg.—A summer visitant.

Length 6, breadth 9 inches; weight half an ounce. Bill and legs black. Mouth yellow. Irides hazel. Front and belly, white. The two middle tail-feathers and quills dusky. *Female*, light brown, inclining to grey on the head and back. The throat white. Nest in the hole of a wall or tree, of moss, lined with hair. Eggs 5 or 6, of a fine blue colour. In the *young* males, the black on the throat, and red on the breast, are freckled with white lines. This species arrives in April and departs in September. Dr Walker, in his MS. notes or Adversaria for 1773, states, that " it builds in Glenea, in Dumfriesshire; comes in May, and goes about the end of August. Is called the *Pink*."

GEN. XXXI. CURRUCA. WARBLER.—Bill a little compressed anteriorly; and the superior ridge near the point is slightly arched.

1. *Marsh Warblers. Crown depressed. Wings short, rounded. Tail long, cuneiform. Frequent the margins of marshes and rivers.*

58. *C. Locustella.* Grasshopper Warbler.—Plumage, above, olivaceous-brown, with the middle of each feather dusky.

Locustella avicula, *Will.* Orn. 151.—Grasshopper Lark, *Penn.* Brit. Zool. i. 382.—Sylvia Loc., *Temm.* Orn. i. 184.—*W*, Gwich hedydd.—A regular summer visitant of England.

Length 5½ inches; weight half an ounce. Bill dusky above, whitish beneath. Legs pale brown. Claws horn coloured. The hind claw short and crooked. Irides hazel. Eyelids, chin, throat, and belly, white. Under the throat, a band of oval deep-brown spots. Breast, sides, and thighs inclining to brown. Under tail-covers pale-brown, with longitudinal dusky streaks. Quills and tail-feathers dusky brown, with the margins slightly tinged with yellow. The *female* is like the male, but with less bright colours. Nest, in furze, of dried stalks, lined with fibrous roots. Eggs of a spotless bluish-white. The singular cricket-like song or chirp is the means of discovering the retreat of this species; otherwise it is a shy bird. I have added the reference to Willoughby, with doubt, as he states the hind claw as " longissimus," in which he is followed by Ray, Syn. Av. p. 70.

59. *C. salicarica.* Sedge Warbler.—Plumage above, yellowish brown, with dusky spots on the crown, back, and scapulars. Over the eye, a yellowish-white streak followed by a black one.

Motacilla salicaria, *Linn.* Syst. i. 330.—Sedge-bird, *Penn.* Brit. Zool. i. 381.—Sylvia Phragmites, *Temm.* Orn. i. 189.—*E*, Sedge-wren; *W*, Kedydd yr helvyg.—A regular summer visitant of England.

Length 5½ inches; weight 3 drams. Bill dusky above, whitish beneath. Legs dusky. Irides hazel. Quills and covers dusky, edged with yellowish-white. Plumage beneath, yellowish-white. The *female* similar. The nest is placed amongst reeds, and consists of dried stalks and moss, lined with dried grass, and a few hairs. Eggs 5 or 6, of a light brown, mottled with darker shades. In the *young*, the broad stripe over the eye is red, and the breast is spotted. Frequents moist places. Has a variety of notes.

60. *C. arundinacea.* Reed Warbler.—Plumage above, plain olive-brown. From the corner of the eye to the nostril, a white band, narrowest towards the bill.

Motacilla ar., *Lightfoot*, Phil. Trans. 1785–8, tab. i.—Reed-Wren, *Mont.* Orn. Dicl.—Sylvia ar., *Temm.* Orn. i. 191.—A regular summer visitant of England, first distinguished by Lightfoot.

Length 5½, breadth 7½ inches; weight 177 grains. Bill half an inch long. Upper mandible horn-colour; lower pale red. Inside of the mouth a deep orange. Legs light olive; the soles bright yellow. Irides olive brown. Chin white, the remainder beneath white, with a tinge of buff. Quill and tail-feathers brown, with pale edges. *Female* similar to the male. The nest consists of dry stalks and hairs, usually fixed to three or four reed stalks, by means of interlaced dried grass or threads. Eggs 4 or 5, dirty white, stained with dull olive-coloured spots. The *young* have not the white stripe in front of the eye.

2. *Wood Warblers.—Body slender. Tail horizontal; the feathers equal. Inhabits woods.*

a. *Tail of one colour.*

61. *C. Luscinia.* Nightingale — Plumage above, reddish-brown; beneath, pale yellowish-ash. Tail deep tawny red.

Luscinia, *Will.* Orn. 161. *Penn.* Brit. Zool. i. 365.—Sylvia Lus., *Temm.* Orn. i. 195.—*W*, Eos.—A regular summer visitant of the eastern counties of England.

Length 7, breadth 10½ inches; weight 6 drams. Bill black; lower mandible pale towards the base. Mouth yellow. Irides hazel. Legs and claws black. *Female* similar. Nest placed on the ground, and composed of dried leaves, lined with grass. Eggs 4 or 5, of a uniform dark brown colour.—This species arrives in the end of April. Its song is universally admired. White varieties occur.

62. *C. hortensis.* Pettychaps.—Plumage above, greyish-brown, with an olive tinge. A white circle round the eye.

Pen. Brit. Zool. i. 376.—Sylvia hort., *Temm.* Orn. i. 206; *W*, y Ffigysog. —A regular summer visitant of the southern counties of England.

Length 6 inches; weight 5 drams. Bill dusky; base of the under mandible yellowish. Inside of the mouth yellow. Legs bluish-brown. Irides hazel. Below the ear a dash of ash-colour. Quills and tail dusky, edged with olive. *Female* similar. Nest in a bush, near the ground, composed of grass and fibrous roots, with moss externally. Eggs 4, dirty white, blotched with light brown and cinereous spots. Song little inferior to that of the Nightingale.

63. *C. sibillatrix.* Wood Wren.—Plumage above, yellowish-green. Over the eye a bright sulphur-yellow streak. Under tail-covers white.

Regulus non cristatus major, *Will.* Orn. 164.—Yellowest Willow Wren, *White's* Selb. i. 95.—Wood Wren, *Lamb*, Lin. Trans. ii. 245., tab. 24. *Mont.* ib. iv. 35., Egg. tab. ii. fig. 1.—Sylvia sib. *Temm.* Orn. i. 223.—A regular summer visitant of England, near oak and beech woods.

Length 5¼ inches; weight 160 grains. Bill dusky. Legs yellowish-brown. Irides hazel. The cheeks and throat are yellow. Upper parts of the breast yellowish white; the remainder pure white. Quills dusky, edged externally with yellowish-green. Tail a little forked, coloured like the quills, except the two outer feathers, which want the yellow margin. *Female* less in size, but similar in plumage. Nest on the ground, oval, with a small hole near the top, composed of dried grass and moss, and lined with a few long hairs. Eggs 6, white, sprinkled with purple spots, which are sometimes confluent.—The flight of this species is short, slow, and vibrating, as it moves from spray to spray. Its cry expresses the word *twee*, drawn out. Has been confounded with *Regulus trochilus* and *hippolais*.

64. *C. Atricapilla.* Black-cap.—Head black above, hind neck cinereous. Plumage above, greyish green.

Atricapilla, *Will.* Orn. 162. *Penn.* Brit. Zool. i. 374.—Sylvia At. *Temm.* Orn. i. 201.—*E*, Mock Nightingale, Nettle-creeper; *W*, Penddur brwyn.—A regular summer visitant. Frequents woods and hedges.

Length 6, breadth 9 inches; weight half an ounce. Bill brown. Legs lead-coloured. Irides dark hazel. Breast and belly cinereous. Vent white. Quills dusky, edged with dull green. Tail long. *Female*, with a brown head. Nest in a low bush, of dried stalks, with wool and moss, and lined with fibrous roots and hair. Eggs 4 or 5, pale reddish-brown, mottled with a deeper colour; sometimes sprinkled with cinereous spots. Song melodious.

a. *Tail particoloured.*

65. *C. provincialis.* Dartford Warbler.—Plumage above, dusky brown. Cheeks cinereous. Throat, neck and breast ferruginous.

Latham, *Pen.* Brit. Zool. i. 389.—Sylvia Dartfordensis, *Mont.* Lin. Trans. vii. 260. Ib. ix. 181.—Sylvia Prov., *Temm.* Orn. i. 211.—Resident in the south of England.

Length 5½ inches; weight 150 grains. Bill black; the base of the upper mandible whitish. Legs yellowish. Irides and eye-lids yellow. Middle of the belly white. Quills dusky, edged externally with dark cinereous. At the bend of the wing, a white spot. The outer tail-feather tipped and edged externally with white; the next slightly tipped with white; the remainder of these, and all the others dusky; the middle ones edged with cinereous. *Female*, paler in the colour, and the throat has whitish streaks. Nest near the top of furze, of dried stalks and wool, loosely put together. Eggs 4, greenish-white, speckled with olivacious brown and grey, the markings forming a zone at the larger end. The *young* have the throat rayed with white, and feathers of the same colour occur on the belly.—This bird is very shy. Its note is weak, but shrill, and several times repeated.

66. C. *sylvia*. White Throat.—Crown of the head and between the bill and the eye cinereous. The rest of the plumage above, tinged with brown. Under parts greyish white.

Will. Orn. 171.—*Penn.* Brit. Zool. i. 387.—Sylvia cinerea, *Temm.* Orn. i. 207.—*S*, Whey-beard, Charlie Mufty; *W*, Y Gwddfgwyn.—A summer visitant in gardens.

Length 6¼, breadth 8½ inches; weight 4 drams. Bill dusky-brown above, whitish beneath. Legs pale brown. Irides yellowish. Grey on the breast, inclining to rufous. Quills dusky, edged with cinereous-brown. Tail similar; outer feathers white, except at the base of the inner web. *Female*, with the plumage above, more inclining to rufous. The throat tinged with the same colour. Nest in hedges or low bushes, of grass, lined with fibrous roots and hairs, and of a loose texture. Eggs 5, greenish-white, speckled with light brown. In the *young*, the plumage above is rufous, and the space before the eye is white.

67. C. *sylviella*.. Lesser White-throat.—Upper part of the head, including the eyes, dark ash. Rest of the plumage above, cinereous brown. Beneath, silvery white.

Lightfoot, Lath. Syn. Sup. p. 185. t. 113. (*Mont.* Orn. Dict.)—Sylvia curruca, *Temm.* Orn. i. 209.—An English summer visitant.

Length 5¼ inches; weight 3¼ drams. Bill and legs dusky. Irides yellowish. Quills and tail dusky, edged with ash. The exterior feather of the tail whitish almost to the base; the outer web quite white. *Female* similar. Nest like the common White Throat. Eggs 4 or 5, bluish-white, speckled with brown and ash at the larger end.—This species is said to be distinguished from the preceding, by the uniform colour of the bill, and the absence of the rufous tinge on the wing-covers.

GEN. XXXII. ACCENTOR.—Bill strong, with inflected edges.

68. A. *modularis*. Hedge-Sparrow.—Crown grey, with brown spots. Sides of the neck, throat, and breast bluish-grey.

Curruca Eliotæ, *Will.* Orn. 157. *Penn.* Brit. Zool. i. 376.—A. mod., *Temm.* Orn. 249.—*S*, Blue Hafit; *W*, Llwyd y gwrych.—A common resident.

Length 5¾ inches; weight 6 drams. Bill dusky. Legs flesh-colour. Irides light hazel. Back and wing-covers dark brown, edged with rufous brown. Belly dirty white. *Female*, with brown spots on the head. Nest in hedges, of moss and wool, or fibrous roots, lined with hair. Eggs 4 or 5, blue.—This bird sings early in the season, and sweetly, and prefers the neighbourhood of houses.

As a straggler, connected with this genus, the *Accentor alpinus* may be noticed. It differs in the plumage above, being grey, with large brown spots on the back, and in the bill being black at the point, and yellow at the base. The feet are yellow.—In the first number of *Zool. Journ.*, p. 134., it is stated, that " a female of this kind had been shot lately in the garden of King's College, Cambridge; it is now preserved in the Rev. Dr Thackeray's collection of British birds."

GEN. XXXIII. REGULUS.—Bill straight, slender, subulate.

69. R. *cristatus*. Golden-crowned Wren.—Crown orange, cheeks grey.

Will. Orn. 163.—Golden-crested Wren; *Penn.* Brit. Zool. 379.—Sylvia Regulus, *Temm.* Orn. i. 229.; *E*, Marygold Finch; *W*, Yswigw, Sywigw.—Resident. Generally distributed.

Length 4¼, breadth 6⅜ inches; weight under 80 grains. Bill and legs black. Irides hazel. Plumage above olive, shaded with cinereous towards the head. The yellow crown surrounded with a black margin. Belly cinereous, more or less tinged with brown and yellow. Quills greyish brown, edged with green. At the base of the secondaries is a black bar, above which the covers are tipped with white, forming a narrow white band; above that the smaller covers are black, tipped with white. Tail dusky, with greenish edges. In the *female* the crown is yellow, and its edges more cinereous than black. Nest on trees, composed of green moss interwoven with wool, and lined with small feathers. Eggs 7 to 10, brownish white, darker at the thick end.—This is a restless bird, and its notes are sweet, though weak.

70. R. *Trochilus*. Yellow Wren.—Plumage, above, greenish-yellow brown. Over the eye a faint yellow streak. Legs brown.

R. non cristatus, *Will.* 164. *Penn.* Brit. Zool. i. 378.—Sylvia Hippolais. *Temm.* Orn. i. 222.—*E*, Willow Wren, Ground Wren, Ground Huckmuch; *W*, Drywr helyg, Sywider.—A regular summer visitant.

Length 5¼ inches; weight 2¾ drams. Bill dusky above, yellowish beneath. Plumage below white, tinged with yellow; on the breast a few yellow streaks. Quills dusky brown, edged with yellow; covers and thighs yellow. Tail dusky, edged with yellow. Nest oval, with the opening near the top, placed at the bottom of a bush, and composed of moss and dried grass. Eggs 6 or 7, white, spotted with light rust colour towards the larger end.

71. R. *Hippolais*. Lesser Pettychaps.—Plumage, above, greenish brown, with a tinge of yellow. Over the eye a faint yellow streak. Legs dusky.

Ficedula septima, *Will.* Orn. 158. *Ray.* Syn. Avium, 19. *Mont.* Orn. Dict. —Sylvia trochilus, *Temm.* i. 224.—*E*, Chip Chop; *S*, White Wren.—A regular summer visitant.

Length 4¾, breadth 7 inches; weight 124 grains. Bill brownish-black, inclining to yellow at the edges; mouth pale saffron-yellow. Irides hazel. Plumage below pale lemon-yellow, the belly mixed with silvery-white, and vent and under tail-covers inclining to deep straw-yellow. Quill and tail-feathers dusky, edged with yellow, except the exterior tail-feather on each side, which is plain. *Female* similar. Nest on the ground, composed externally of dried leaves, then coarse grass, and lined with feathers. Eggs 6, white, speckled with purplish-red at the larger end only, and here and there a single speck on the sides.—This bird arrives in the south of England about the end of March; is restless; and utters its double notes four or five times in succession, resembling the words *Chip Chop.*—Temminck seems to have misplaced the synonimes of these two last species. We have followed Montagu.

GEN. XXXIV. TROGLODYTES. WREN.—Bill slightly bent, slender, subulate.

72. T. *vulgaris.* Common Wren.—Plumage, above, dark reddish-brown, crossed by obscure dusky lines; over the eye a narrow light streak.

Passer troglodytes, *Will.* Orn. 164. *Sibb.* Scot. 18.—Motacilla troglodytes, *Linn.* Syst. i. 337. *Penn.* Brit. Zool. i. 380.—Sylvia troglodytes, *Temm.* i. 233.—*S*, Kittywren; *W*, Dryw; *G*, Dreathan.—Resident and common.

Length 4½, breadth 6½ inches, weight nearly 3 drams. Bill and legs dusky brown; the inside of the mouth yellow. Irides dark hazel. Quills dusky-brown, spotted on the outer webs with light brown. Tail of 12 feathers, crossed with dusky black lines. Plumage, beneath, light rufous brown; sides and thighs crossed with darker lines. Under tail-covers obscurely spotted with black and white. *Female* smaller, lighter in the colour, with the transverse bars less distinct. Nest placed under the thatch of houses, against a mossy tree or bank; usually composed of moss, lined with feathers and hair. The eggs are generally 7 or 8, but sometimes double that number, white, with a few small reddish spots at the larger end.—This little insectivorous bird braves the severest winters, and, like the Golden-Crowned Wren, is resident in Zetland. Sings sweetly in spring.

GEN. XXXV. MOTACILLA. WAGTAIL.—Tarsus double the length of the middle toe. Tail constantly in motion. Pace running.

73. M. *alba.* White Wagtail.—The front, cheeks, side of the neck and belly white.

Will. Orn. 171. *Sibb.* Scot. 18. *Penn.* Brit. Zool. i. 142. *Temm.* Orn. i. 255., Water-wagtail.—*E*, Dish-washer, Washer-woman; *W*, Brith y fyches, Tinsigl y gwys; *G*, Breal ant sil.—Resident near water.

Length 7½, breadth 11 inches; weight 6 drams. Bill, mouth, and legs, black. Irides hazel. The back of the head, upper and under side of the neck, chin, and breast, black. Back dusky, inclining to cinereous. Quills dusky; the greater covers black, with white tips. Tail black; the two lateral feathers white, but black at the base. In winter the chin and throat are white. In the *female* the black is more dusky, and the white less pure; the tips of the covers grey. Nest in walls or on old trees; composed of moss, dried grass and wool, and lined with hair or feathers. Eggs 4 or 5, white, spotted with light brown and ash-colour. The *young* birds have the under side of a dirty white, the breast a brown ash, and no black on the throat. Retires in the severity of winter to the sea-shore.

74. M. *boarula*. Grey Wagtail.—Above grey, beneath buffy-yellow, vent and rump pale yellow.

M. cinerea, *Will.* Orn. 172. *Penn.* Brit. Zool. i. 368.—M. boar. *Temm.* Orn. i. 257.—*E*, Winter Wagtail; *W*, Brith y fyches lwyd.—Chiefly observed in winter.

Size of the last. Bill dusky; legs brownish. Irides dark hazel. Throat black, a white band above the eyes and sides of the throat. Wing-covers and quills black, bordered with yellowish-white. The three outer tail-feathers white, the second and third, with the outer web, black at the base, the others dusky. In winter the black on the throat disappears. The *female* wants the black on the throat according to Temminck, but she possesses it according to Montagu, whose accuracy, in this respect, is attested by Mr Selby,—"Illustrations," p. 211. Nest in heaps of stones. Eggs 6, pointed, dirty white, with reddish spots.—Breeds in Devonshire, according to Mr Tucker (*Mont.* Orn. Dict. Supt.) Resides in other parts, during the winter months, chiefly near streams.

75. M. *flava*. Yellow Wagtail.—Plumage olive-green above, beneath bright yellow.

Will. Orn. 172. *Sibb.* Scot. 18. *Penn.* Brit. Zool. i. 362. *Temm.* Orn. i. 260.—*W*, Brith y fyches felen.—A summer visitant.

Size of *M. alba*. Bill and legs black. The hind claw long and nearly straight. Irides hazel. A white streak over the eye. Quills and tail dusky, but the two lateral ones of the last white from the middle. *Female* more cinereous above, and whiter below. Nest in holes in the ground, or at the roots of trees; of dry grass, lined with hair. Eggs 6, rounded, olive-green, with flesh-coloured spots. *Young* like the female, with reddish-brown markings on the breast and belly.—Chiefly frequents cultivated ground, and seems less attached to water than the other species. It constitutes the subgenus BUDYTES of Cuvier, *Regne Animal*, i. 371.

GEN. XXXVI. ANTHUS. TITLING.—Mandibles, with the margins inflected near the middle; the upper with a ridge at the base.

76. A. *petrorsus*. Sea Titling.—Hind-claw the length of the toe. Over the eye, and on the ear, a white streak.

Variety of Titlark, *Penn.* Brit. Zool. i. 258.—Alauda obscura and petrosa, *Mont.* Lin. Trans. iv. 41.—Anth. aquaticus, *Temm.* Orn. i. 265.—*E*, Rock Lark.—Common on the sea shore.

Length 7, breadth 11½ inches; weight 7 drams. Bill black, with a yellowish margin; the inside of the mouth yellow. Feet dusky, with a tinge of yellow. Irides deep chesnut. Plumage, above, dusky olive, with pale edges, on the head, neck, scapulars, and rump, inclining to cinereous. Beneath, white, with a tinge of yellow on the breast, and obscure longitudinal spots on the sides. Quills black, edged with pale yellow. Wings, when closed, extend to half the length of the tail. Tail, with the two middle feathers, greyish-brown, the others black, the lateral ones dirty white for half their length. *Female* less than the male; more dusky above, having little olive or ash on the back. Nest of dried grass or algæ, with a few hairs. Eggs 4 or 5 dirty white, with numerous specks of brown, crowded and confluent at the larger end. In the *young* the upper parts have a tinge of olivaceous ash colour;

beneath, the lighter parts are yellowish, and the coverts of the wings more deeply margined with light brown; the legs more inclining to yellow. Seeks its food as the tide retires.

77. A. *pratensis*. Meadow Titling.—Hind claw longer than the toe, and but slightly bent. From the gape on each side a dusky line passes down the side of the throat.

Alauda pratorum, *Will.* Orn. 150. *Sibb.* Scot. 17. Al. pratensis, *Linn.* Syst. i. 287.—Titlark, *Penn.* Brit. Zool. i. 357.—Anth. prat. *Temm.* Orn. i. 269.—Common near marshes.

Length 5¾ inches; weight upwards of half an ounce. Bill dusky, yellowish at the base of the lower mandible. Legs brownish. Plumage, above, dusky-brown, with paler margins, beneath dirty white, the sides of the neck and breast marked with oblong dusky spots. Quills dusky brown, with paler edges, the first four, according to Willoughby, of equal length. Tail dusky, outer feather white, except at the base of the inner web; the second has a little white at the point. In winter the pale margins of the plumage, above, are broader, and have more of an olive tinge. In this state it is the Pipit Lark of Mont. Orn. Dict. *Female* very like the male. Nest on the ground; of dried grass, lined with hair. Eggs 6, variable in colour. The *young* birds have the margin of the feathers of a greenish tinge.

78. A. *trivialis*. Field Titling.—Hind-claw shorter than the toe, and muched hooked. Two yellowish-white bands on the wings.

Alauda minor campestris, *Will.* Orn. 150.—Al. triv. *Linn.* Syst. i. 288.—Field Lark, *Penn.* Brit. Zool. i. 358.—An. arboreus, *Temm.* Orn. i. 271.—A summer visitant of England.

Length 6½ inches; weight 5 drams. Bill dusky above, whitish beneath. Legs yellowish-brown; claws horn colour. Irides hazel. Plumage, above, light yellowish-brown, with the middle of each feather dusky-brown. Rump plain light brown. Wing-covers tipped with white. Throat and breast ochraceous yellow; belly yellowish-white. Tail-feathers pointed, the exterior one-half white, the rest with the tip slightly white. Nest of dry grass and moss, lined with hair; placed amongst high grass or green wheat. Eggs 4, dirty bluish-white, thickly blotched and spotted with purplish-brown. Chiefly frequents enclosed districts; and, according to Montagu, "from the beginning of May to July, it may be seen mounting in the air in a fluttering manner, at the same time uttering a twittering note, and then descends to some neighbouring tree, with motionless wing and the tail thrown up. At this time it sings, but never when rising. And it is observable, that it rarely pitches on the ground again until it has perched; and it always mounts in the like manner from a tree before it descends to the ground."—*Mont.* Orn. Dict.

Anthus Richardi, (*Temm.* Orn. i. 263.). It is stated in the proceedings of the Linnean Society, in the "Annals of Philosophy" for March 1825, p. 226., that Mr Vigors described three species of British Birds, of which A. Richardi was one; "two specimens of which were taken a few years ago at Kingsland, near London." In the paper, however, in which this species seems originally to have been included, published in Lin. Trans. xiv. 556, no notice is taken of the bird.

GEN. XXXVII. LOXIA.—Bill compressed; both mandibles with hooked points, crossing each other at the plane of the gape.

79. L. *curvirostra.* Crossbill.—Bill as long as the middle toe. Wings destitute of white bands.

Loxia, *Will.* Orn. 181. *Sibb.* Scot. 10. *Linn.* Syst. i. 299. *Penn.* Brit. Zool. i. 319. *Temm.* Orn. i. 328.—*E*, Shill Apple; *W*, Gylfingroes.—Summer visitant.

Length 6¾, breadth 11½ inches; weight 1½ ounces. Bill dark horn colour; the tongue cartilaginous, concave, and broad before. Legs and claws dusky; soles tubercular; claws regularly curved, with sharp margins. Irides dusky. Wings dusky, the outer margins of the feathers pale. The first and third quills equal, the second, the longest; the second, third, and fourth, slightly abbreviated on the outer web. Tail dusky, forked, of 12 feathers, obliquely truncated outwards at the extremity. The plumage at the vent inclines to white; on the rest of the body, except the wings and tail, it is of a reddish orange, changing with age into yellow and cinereous. The plumage of the *female* is dull, cinereous, mixed with green. Breeds, early in the spring, in the north of Europe in the pine forests, in the clefts of branches. Eggs 4 or 5, greenish-grey, with a circle of brown spots and rays at the larger end. *Young* like the female. Food consists of the seeds of fir-apples, which it readily reaches by means of its singular bill.—In a cage its motions resemble those of a parrot. It is not known to breed here, but visits us in June, and continues throughout the summer. A male and female were sent us in December 1822 by the Rev. Alexander Espline, Schoolmaster of Monymeal. In both examples the lower jaw crossed the left side of the upper. The muscles on the right side for closing the lower jaw were much larger than those on the left,—a singular example of compensation for the loss of power, occasioned by the oblique position and motion of the lower jaw.

As stragglers connected with this genus the two following species merit some notice.

(1.) L. *Pytiopsittacus.* Parrot Grossbill.—This species is supposed to be referred to by Pennant in his Brit. Zool. i. 319., "We received a male and female out of Shropshire, which were superior in size to the former; the bill remarkably thick and short, more curvated than that of the common kind, and the ends more blunt." A Scottish example of this species was sent from Ross-shire to Mr D. Ross, gunmaker, Edinburgh, and is recorded, on the authority of Sir William Jardine, by Mr Selby, in his valuable "Illustrations of British Ornithology," i. p. 254. According to Temminck, Orn. i. 325., the bill is shorter than the middle-toe, and seven lines broad at the base. This species is common to Europe and North America, and may be expected to occur in this country occasionally.

(2.) L. *falcirostra.* White-winged Crossbill.—According to Mr Templeton, a female of this species "was shot within two miles of Belfast, in the month of January 1802," Lin. Trans. vii. 309. It is a native of North America, and may readily be distinguished by its inferior size, and by two white bands across the wings.

GEN. XXXVIII. CORYTHUS. HAWFINCH.—Bill inflated. Upper mandible bent over the under.

80. C. *Enucleator.* Common Hawfinch.—Colour reddish; the wings and tail black.

Loxia en. *Linn.* Syst. i. 299.—Pine Gross-Beak. *Penn.* Brit. Zool. i. 317. —Pyrrhula en. *Temm.* Orn. i. 333.—A summer visitant of Scotland.

Length 7½ inches; weight 2 ounces. Bill and legs black. Head and neck orange-red; bill yellowish-orange; back and rump with black feathers, having a yellow margin. Two cross bars of white on the wings. Quills and tail-feathers edged with orange. The *female* has the red more tinged with brown, and the back and belly cinereous. Nest on trees. Eggs 4, of a white colour. Food the seeds of trees. Pennant noticed individuals of this species in the pine forest of Invercauld, Aberdeenshire, in August, and conjectures that they bred there. Mr Selby, in his "Illustrations," p. 257., seems inclined to regard them as only occasional visitants.

GEN. XXXIX. EMBERIZA. BUNTING.—Bill short, conical, the palate furnished with a bony knob.

81. E. *Citrinella*. Yellow Bunting.—Head, neck, and breast gamboge yellow.

E. flava, *Will.* Orn. 196.—Citrinella *Sibb.* Scot. 18.—E. Citrinella, *Linn.* Syst. i. 309.—*E*, Yellow Stammer, Yellow Yowly; *S*, Yite, Yellow Yeldrock; *W*, Llinos felen; *G*, Buidheag bhealaidh.—Common.

Length 6½, breadth 10 inches; weight 7 drams. Bill bluish; irides hazel; legs yellow. Back yellowish-brown, tinged with green. Quills black, edged with yellow. Rump brownish-orange. Tail dusky, edged with greenish-yellow; the inner web of the two external feathers, on each side, with a large spot of white. In the *female* the colours are paler, and the yellow inclines more to brown. Pair in May. Nest on the ground among low grass, ot dried stalks, lined with hair. Eggs 5, of a pale purplish white, with red streaks. This species is familiar, and resides near the dwellings of men. In geographical distribution it reaches not to Orkney.

This species varies in the yellow of the head being replaced by olive-green, in which state it is the E. *chlorocephala* of Gmelin (Turton's trans. i. 544.), and has occurred in the neighbourhood of London.

82. E. *Cirlus*. Cirl Bunting.—The throat and a band over the eye black.

Linn. Syst. i. 311.—Cirl Bunting, *Mont.* Orn. Dict. and Lin. Trans. vii. 276. *Temm.* Orn. i. 313.—Breeds in Devonshire.

Size like the last. Bill bluish; irides hazel; legs brown; claws dusky. A yellow band above and below the eye. Lower part of the neck yellow; breast olive-grey; belly yellow; back brown. Quills dusky, edged with green. Tail, with the two middle tail-feathers chesnut, the rest black, except the two exterior ones on each side, which have an oblique bar of white from the tip half way; and the outmost feather is white throughout the whole of the exterior web. *Female* smaller, with the plumage spotted with dusky. Pair in April. Nest in a low bush; of dry stalks, lined with hair. Eggs 4 or 5, greyish-white, with irregular long and short curved dusky lines.—This species was first observed in Britain by Montagu, in 1800, in Devonshire, where it breeds and is resident; congregating in the winter with Yellow Buntings and Chaffinches. A straggler of this species has been shot near Edinburgh, as noticed by Mr Wilson in Wern. Mem. ii. 658.

83. E. *Miliaria*. Common Bunting.—Plumage, above yellowish-brown, inclining to oil-green, the centre of the feathers dusky.

E. alba, *Will.* Orn. 195. *Sibb.* Scot. 18. E. Mil. *Linn.* Syst. i. 308. *Penn.* Brit. Zool. i. 324. *Temm.* Orn. i. 306.—*E*, Bunting-lark, Ebb.; *S*, Corn-bunting; *W*, Bras-y-ddruttan, bras-yr-yd; *G*, Gelag-bhuachair.—Common near corn-fields.

Length 7½, breadth 11½ inches; weight about 2 ounces. Bill brown; irides dark hazel; legs yellow. Throat white, with black spots; belly white; wings and tail black, the coverts edged with yellowish-brown. Female like the male. Nest on the ground like its congeners. Eggs 4, whitish, spotted and veined with brown. The young have a reddish tinge. This bunting is gregarious in winter, and is often taken in lark-nets, and brought to market. It extends to the Zetland Islands.

84. E. *Schœniculus.* Reed Bunting.—The head, chin, and throat black.

Passer torquatus in arundinetis nidificans, *Will.* Orn. 196.—E. sch. *Linn.* Syst. i. 311. *Penn.* Brit. Zool. i. 326. *Temm.* Orn. i. 307.—*E*, Reed Sparrow, Water-Sparrow; *S*, Black-Bonnet; *W*, Golfan-y-cyrs.—A common resident near marshy ground.

Length 6½, breadth 10 inches; weight ounce. Bill black; irides and feet brown. A band of white commences at the corners of the mouth, and, growing broader behind the ears, encircles the head. Belly white. Back black, the feathers edged with brown. Quills brown, with pale edges. Tail with the two middle feathers brown, with pale edges; the two exterior ones on each side half white and half black, with a brown spot near the tip. In the *female* the head is tinged with reddish-brown, the white on the belly inclines to dusky, and there is no white ring round the head. Nest in grass or furze near the ground, of dried stalks, lined with fine grass and hair. Eggs, 4, bluish-white, with brown spots and veins. The white ring is wanting in the young males.—Gregarious in winter, and mixing with other species. Does not occur in the northern islands.

85. E. *nivalis.* Snow-Bunting.—Tip of the bill, legs, feet, and claws, black; the claw of the hind-toe produced.

Montifringilla calcaribus Alaudæ, *Will.* 187.—Fringilla, *Sibb.* Scott. 18. —E. niv. *Linn.* Syst. i. 308.—Fab. Faun. Gr. 117.—*Penn.* Brit. Zool. i. 329. *Temm.* Orn. i. 319. *S*, Snowflake; *W*, Golfan-yr-eira; *G*, Eunt-sneachdaidb.—A winter visitant.

Length 6½, breadth 12½ inches; weight 1½ ounces. Bill black, yellow within; irides hazel. The head, neck, breast, belly, and rump white, with the roots of the feathers black. Back black, with pale edges. Primaries black, with a white base. Middle tail-feathers black, the three outer ones white, with a dusky spot near the end. In the female the black is paler, and the white dusky. Nest in crevices of rocks, in May, constructed on the outside with grass, lined with feathers, and then with hair. Eggs 5, white, with dusky spots. In the young, the base of the bill is yellow, and the head, ear-coverts, breast, and sides, more or less mixed with chesnut. The feathers on the back dusky, with rufous edges. In this state, or some of its numerous varieties, it is the *Tawny Bunting* and Mountain Bunting of Penn. Brit. Zool. i. 327., and 321.—This bunting breeds in Greenland, visits this country in harvest, and retires in spring. It is first seen on the high ground in stubble-fields, and its motions resemble those of the lark. As the winter advances it approaches the corn-yard, and feeds with the sparrow and finches. In Zetland it is called Oat-fowl, from the preference which it gives to that kind of grain.

As a straggler, may be noticed the *E. cirus*, Turton's Lin. Syst. i. 542., distinguished by having the head blue; belly orange; back green. It is a native of South America. Montagu, in his Supplement to his Orn. Dict., article Grosbeak, says, " A painted Bunting, *E. cirus*, was taken alive on Portland Island, in the year 1802, having doubtless made its escape from on board some ship going up Channel, or that came to anchor off Weymouth. This bird we saw alive in the possession of Mrs Stewart of that place."

GEN. XL. ALAUDA. LARK.—Bill conico-subulate. Palate plain. Hind claw produced.

86. A. *arvensis*. Field-Lark. — Plumage reddish-brown above, yellowish-white, with dusky streaks beneath. Hind-claw nearly straight, and longer than the toe.

A. vulgaris, *Will.* Orn. 149. *Sibb.* Scot. 17.—A. ar. *Linn.* Syst. i. 287. *Penn.* Brit. Zool. i. 353. *Temm.* Orn. i. 281.—*E*, Skye-Lark; *S*, Laverock; *W*, Hedydd, Uchedydd; *G*, Uiseag.—A common resident.

Length 7, breadth 12 inches; weight an ounce and a half. Bill dusky, the base of the lower mandible yellowish. Legs and claws dusky. Hindhead tinged with cinereous. Quills brown, with pale tips and edges. Tail brown; the two middle feathers darkest; the outer feather white on the outer web and tip of the inner; the second white on the outer web only. The *female* resembles the male. Pair in April. Nest on the ground, of dry stalks, lined with fine roots of grass. Eggs 4, dirty white, spotted with brown.—The lark abounds in open cultivated situations. Is esteemed for its song, and as a delicacy for the table. Congregates in wandering flocks during the winter.

87. A. *rubra*. Red Lark.—Plumage above rufous-brown, beneath reddish-white. Hind-claw curved, and of the length of the toe.

Penn. Brit. Zool. i. 359. *Turton's* Gm. Syst. i. 482.—In England, rare.

Size same as the preceding. Bill dusky above, whitish beneath; legs pale brown. A white line above and below the eye. Chin and throat white. Back with black, and breast with dusky spots. Middle feather of the tail black, edged with brown, the two exterior white.—This species was first detected, near London, by Edwards. One from the same quarter is described by Montagu, in his "Ornithological Dictionary," and another sent him by Mr Foljambe, taken in the winter of 1812, near Woolwich, which measured full 7½ inches in length. He says, in the Supplement, "The size, the bill, legs, and the hind-claw, bespeak the species; especially the great length of the tail in proportion to the wings, which, when closed, do not reach within two inches of the end."

88. A. *arborea*. Wood-Lark.—A white band from the bill over the eyes, surrounding the crown of the head.

Will. Orn. 149. *Sibb.* Scot. 17. *Linn.* Syst. i. 287. *Penn.* Brit. Zool. i. 356. *Temm.* Orn. i. 283.—*W*, Hedydd-y-coed; *G*, Riabhag-choille.—In the neighbourhood of woods.

Length 6½, breadth 12½ inches; weight about an ounce. Bill dusky, whitish at the base of the lower mandible. Irides hazel. Legs yellow. Plumage above, brownish-black, with pale edges; cheeks yellowish-white; beneath pale yellowish-white, with dusky longitudinal streaks. Quills dusky, edged with brown; the coverts tipped with white. The two middle tail-feathers brown, the next dusky, and the four exterior ones black. The *female* wants the tinge of yellow beneath, and the white band of the head is obscure. Pair in March. Nest on the ground, of coarse grass, lined with finer fibres, with sometimes a few long hairs. Eggs 4, wood-brown, with blotches of grey and brown.—This species lives in families during the winter. Chiefly sings in the air, flying in large irregular circles, or when perched on the top of a tree. Sings sometimes late in the evening, and has been mistaken for the nightingale.

GEN. XLI. PARUS. TITMOUSE.—Bill short, pointed, sharp edged. Nostrils concealed in deflected hairs and feathers.

89. P. *major*. Great Titmouse or Ox-Eye.—The head, neck, and middle line of the belly black; the cheeks white.

Fringillago, seu Parus major, *Will.* Orn. 174.—P. m. *Sibb.* Scott. 18. *Linn.* Syst. i. 341. *Penn.* Brit. Zool. i. 390. *Temm.* Orn. i. 287.—*W*, Y-Benloyn-fwyaf.—In woods and gardens.

Length 6, breadth 9 inches; weight 10 drams. Bill black; tongue ending in four filaments. Legs lead-grey. Irides dusky. Back olive-green. Rump and wing-coverts grey, the latter tipped with blue. Quills greenish-grey, with pale edges. Sides of the belly yellowish-white. Tail dusky, outer feather white on the exterior web; under tail-coverts white. In the *female*, the black on the head, and the yellow on the sides are less bright, and the black line does not reach the whole length of the belly. *Nest* in the hole of a tree or wall, of moss lined with hair. Eggs from 6 to 8, white, with rusty spots. —The food consists of seeds, insects, and carrion.—Seldom frequents exposed situations.

90. P. *ater*. Colemouse.—Head, neck, and upper breast black; cheeks and nape white.

Will. Orn. 175. *Linn.* Syst. i. 341. *Penn.* Brit. Zool. i. 392. *Temm.* Orn. i. 288.—*W*, Y-Benloyn-lygliw; *G*, Cailcheag-chean-dubh.—In woods.

Length 4½, breadth 7 inches; weight 2 drams. Bill black. Irides hazel. Legs lead-grey. Plumage above greyish; belly yellowish-white. Covers of the secondaries, and those above, tipped with white, forming two bars across the wing. *Female* with the white on the cheeks less extended. Nest in holes of old trees near the ground, of moss lined with hair. Eggs 6 or 8, with reddish spots. Food like the former.—This species seems rare in England. In Scotland it is common in woods.

91. P. *palustris*. Marsh-Titmouse.—Head, neck, and throat black; cheeks yellowish-white.

Will. Orn. 175. *Linn.* Syst. i. 341. *Penn.* Brit. Zool. i. 393. *Temm.* Orn. i. 291.—*E*, Little black-headed Tomtit, Blackcap; *W*, Penloyn-y-cyrs.—In woods in England.

Length 4½, breadth 8 inches; weight 3 drams. Bill dusky; irides hazel. Legs lead-grey. Plumage, above, yellowish-grey; beneath brownish-white. Quills and tail bluish-grey, with pale margins. *Female* with the black on the head less dull, and the throat is spotted with grey. *Nest* in holes of trees, of moss, lined with thistle or willow down. *Eggs* from 6 to 8, white, with brown spots.—This species which is common in England, frequenting brushwood in moist situations, has been confounded with the preceding, from which it differs, in wanting the white on the back of the head, and the two white bars on the wings; in being of a larger size, and in having the tail longer.

92. P. *cæruleus*. Blue Titmouse.—Crown blue, with a white border; cheeks white, with a dark blue border.

Will. Orn. 175. *Sibb.* Scot. 18. *Lin.* Syst. i. 341. *Penn.* Brit. Zool. i. 391. *Temm.* Orn. i. 289.—*E*, Nun, Tomtit, Hickmall, Blue-cap, Titmall, Tinnock, Willow-biter; *S*, Ox-eye; *W*, Y Lleian.

Length 4½, breadth 8 inches; weight 3 drams. Bill dusky; legs, lead-grey. A black line extends from the gape across the eyes to the hind-head.

Back olive-green. Wings and tail blue. A white bar on the wings. Throat and middle line of the belly black. Irides and belly yellow. The *female* has the crown grey, and the list of the belly indistinct.—Nest, in the holes of trees or walls, of moss lined with feathers and hair.—Eggs 6 or 8, white, spotted with brown.—This species is common in gardens.

93. P. *cristatus*. Crested Titmouse.—Crown feathers elongated, and, with those on the cheeks and sides of the neck, black with white margins.

Will. Orn. 175. *Linn.* Syst. i. 340. *Temm.* Orn. i. 290.—In fir-woods, Scotland.

Length 4¾, breadth 8½ inches; weight 2½ drams. Bill black. Irides hazel. Feet lead-coloured. A black stroke crosses the cheek, under the eye, and turns back under the ear at an acute angle. Chin and throat black; above, yellowish-brown with a tinge of yellow; beneath, white tinged with ochreous yellow. In the *female*, the black on the throat is more circumscribed, and the crest is less distinct.—Nest in hollow trees. Eggs 10, white, with reddish spots.—This species is unknown in England. According to Latham and Montagu, it inhabits the pine forests of Glenmore.

94. P. *caudatus*. Long-tailed Titmouse.—Crown, cheeks, and throat white; across the eye, nape and back black.

Will. Orn. 176. *Linn.* Syst. i. 342. *Penn.* Brit. Zool. i. 394. *Temm.* Orn. i. 296.—*E*, Huckmuck, Bottle-tom, Long-tail Mag, Capon or Pie, Mumruffin; *W.* Y-Benloyn-gynffonhir.—In woods and hedges.

Length 5¼ inches; weight 2 drams. Bill and legs black. Irides hazel; margin of the eye-lids yellow. Back rose-red; belly ash-grey, with a rosy hue. Quills black; secondaries edged with grey. Tail with the four middle feathers black, the others tipped and obliquely marked with white on the outer webs. *Female* like the male.—Nest in the fork of a tree, of an oval form, with two openings, and constructed with lichens and wool, lined with feathers. Eggs 9 to 12, white, sparingly marked with rusty spots.—The *young* have the cheeks spotted, and associate with their parents during winter, frequently shifting quarters.

95. P. *biarmicus*. Bearded Titmouse.—Head and nape grey; cheeks black; throat white.

Linn. Syst. i. 342. *Penn.* Brit. Zool. i. 396. *Temm.* Orn. i. 298.—*W*, Y-Barfog.—Among reeds in marshes, England.

Length 6¼ inches. Bill orange-yellow, a little bent; the upper mandible the longest. Irides gamboge-yellow. Legs black. Cheek-feathers loose. Back and belly yellowish-brown. Quills blackish-grey, edged with white. Tail orange-brown, the external feathers with their outer webs and tips pale reddish-white. Under tail-covers black. The *female* is destitute of black cheeks.—Nest among rushes (unknown in Britain). Eggs 6 or 8, reddish, with brown spots. *Young* are of a bright reddish colour.

GEN. XLII. SITTA. NUTHATCH.—Bill slightly compressed, angular. Hind-toe strong.

96. S. *europæa*. Common Nuthatch.—Chin and cheeks white; a black band across the eye and ear-covers.

Sitta seu Picus cinereus, *Will.* Orn. 98. *Sibb.* Scot. 15.—S. eur., *Linn.* Syst. i. 177. *Penn.* Brit. Zool. i. 255. *Temm.* Orn. i. 407.—*E*, Nutjobber, Woodcracker; *W*, Delor-ye-enau.—In wooded situations in the south of England.

Length 6 inches; weight 6 drams. Bill dusky, lower mandible white at the base. Legs grey, claws hooked. Irides brown. Plumage above, blackish-grey; below, buff-orange. Quills dusky. Tail short, of twelve flexible feathers; the two middle grey; the four outer black, with a white bar; the tip ash-grey. *Female* less; the band over the eye indistinct.—Nest in the holes of trees, the opening formed with clay, and the cavity lined with dead leaves. Eggs 5 or 6, greyish-white, spotted with reddish-brown. The female sits close, and refuses to leave the nest upon being disturbed.—This bird runs upwards and downwards on the trunks of trees without difficulty.

Sibbald seems to consider this species, probably erroneously, as an inhabitant of Scotland. In England it is chiefly confined to the southern parts, though Mr Selby has succeeded in tracing it as far north as to the banks of the Wear and Tyne.

GEN. XLIII. PYRRHULA. BULLFINCH.—Bill short, thick, hooked, with inflated sides, the ridge advancing on the forehead. Middle-toe longer than the tarsus.

97. P. *vulgaris*. Common Bullfinch.—Crown, base of the bill, throat, wings, and tail black.

Rubicilla, sive Pyrrhula, *Will.* Orn. 180. *Sibb.* Scot. 18.—Loxia Pyrrhula, *Linn.* Syst. i. 300. *Penn.* Brit Zool. i. 322.—Pyrrh. vul., *Temm.* Orn. i. 338.—*E*, Red-hoop, Tomy-hoop; *S*, Alp, Nobe; *W*, Y Chwybanydd, Rhawn-goch; *G*, Corcan-coille.—In wooded districts, common.

Length about 6 inches. Bill and feet black. Irides brown. Nape of the neck and back grey; cheeks, neck, breast, belly and flanks bright tile-red; rump and vent white. Quill-covers tipped and edged with pink-white. *Female* bluish-grey above, brocoli-brown below; in other parts like the male, but with colours less distinct.—Pairs in April. Nest in hedges, of dry twigs, lined with fibrous roots. Eggs 5, bluish-white, spotted with pale orange-brown. *Young* birds like the female, but destitute of the black on the head. —Feeds on seeds, and buds of trees.

GEN. XLIV. COCCOTHRAUSTES. GROSBEAK.—Bill large, conical, blunt, inflated; the ridge rounded; the edge of the lower mandible inflected.

98. C. *vulgaris*. Common Grosbeak.—Cheeks, head, and rump brown; front, lores and throat black.

Will. Orn. 178.—Loxia Coc., *Linn.* Syst. i. 299. *Penn.* Brit. Zool. i. 316. —Fringilla Coc., *Temm.* Orn. i. 344.—*E*, Cherry-finch; *W*, Gylfinbraff.—A winter visitant of the south of England.

Length 6, breadth 12 inches; weight 2 ounces. Bill pinkish-white. Legs pale brown. Irides ash-grey. Collar, round the nape of the neck, bluish-grey. Beak and smaller wing-covers reddish-brown; the greater coverts tipped with white. Quills black; from the fourth to the fifteenth with a white oblong spot on the inner web; truncated at their ends. Tail black; the four middle feathers half white from the point, the rest with only the inner webs white. Colours of the female obscure.—Nest on trees. Eggs 5, ash-grey, tinged with green and with brown spots. In the *young*, the head and throat are yellow, beneath white.—This species, which breeds in the mountainous regions of Europe, visits England in autumn, in small flocks of four or five, feeds on the berries of the hawthorn during winter, and departs in April.

99. C. *Chloris*. Green Grosbeak.—Plumage bright oil-green, wing-covers smoke-grey.

Chloris, *Will.* Orn. 179. *Sibb.* Scot. 18.—Loxia ch., *Linn.* Syst. 1. 304. *Penn.* Brit. Zool. i. 322.—Fringilla ch., *Temm.* Orn. i. 346.—*W*, Y Gegid, Llinos-werdd ; *G*, Glaisean darach.—Common in all inclosed wooded districts. Green Linnet.

Length 6½, breadth 10½ inches ; weight an ounce. Bill flesh-coloured ; the margin at the chin heart-shaped. Legs wood-brown. Irides hazel. Margins of the feather greyish. The edges of the quills and tail-feathers of a brighter yellow. *Female* more dusky.—Pairs in May. Nest in hedges, of moss lined with hair and feathers. Eggs 5, bluish-white, speckled with brown. *Young* like the female.—Easily tamed, and familiar. Congregates with linnets and chaffinches during the winter.

GEN. XLV. PYRGITA. SPARROW.—Bill conical, subacuminated, rounded above, the margin of the upper mandible inflected under the nostrils.

100. P. *domestica*. House-Sparrow.—Crown and nape bluish-grey ; cheeks greyish-white.

Passer domesticus, *Will.* Orn. 182. *Sibb.* Scot. 18.—Fringilla dom. *Linn.* Syst. i. 323. *Penn.* Brit. Zool. i. 338. *Temm.* Orn. i. 350.—*W*, Aderyn-ye-to, Golfan ; *G*, Gealbhan.—Common.

Length 6½ inches ; weight 1½ ounces. Bill black, notched at the tip. Legs brown. Irides hazel. Lores, chin, throat, and gorget black. An orange-brown band passes above the eyes and over the ears. Feathers on the back black, edged with brown. Breeds early. *Female* with the bill flesh-coloured, with a black tip ; the throat and middle of the belly grey.—Nest in holes, or on trees, of straws and feathers. Eggs 5, greyish-white, with darker spots.

101. P. *montana*. Tree-Sparrow.—Crown and nape chesnut-brown ; sides of the neck and breast white.

Passer montanus, *Will.* Orn. 185.—Fringilla mont. *Linn.* Syst. i. 324. *Penn.* Brit. Zool. i. 339. *Temm.* Orn. i. 334.—*W*, Golfan-ye-mynydd. —Inhabits the middle districts of England, remote from houses.

Length 5½ inches ; weight 6 drams. Bill black. Legs pale brown. Irides hazel. Chin and spot behind the eye black. Upper part of the back having one web of the feathers black and the other white ; under greyish-white. Wing-covers rufous, edged with black, and crossed by two bars of white. Quills black, with yellowish-brown edges. Tail even. *Female* like the male.—According to Montagu, Sup. Orn. Dict., this species breeds in holes in old trees. Nest like the preceding, but the eggs are smaller.

GEN. XLVI. FRINGILLA. FINCH.—Bill conical, pointed, more or less produced.

102. F. *cœlebs*. Chaffinch.—Front black ; crown, nape, and sides of the neck deep greyish-blue.

Will. Orn. 186. *Sibb.* Scot. 18. *Linn.* Syst. i. 318. *Penn.* Brit. Zool. i. 335. *Temm.* Orn. i. 357.—*E*, Buck-finch, Horse-finch, Pink, Twink, Skelly; *S*, Shilfa; *W*, Asgell-arian, Winc; *G*, Briecan beatha.—Common.

Size of a sparrow. Bill blue, tip black. Irides hazel. Legs brown. Cheeks, neck, and breast pale reddish-brown. Back chesnut, the feathers with pale yellowish-grey margins. Belly and vent white. Rump sulphur-yellow. Lesser wing-covers white, those of the primaries black, and those of the secondaries black tipped with yellow. The three first quills black, the outer web with a white edge. Tail, with two middle feathers bluish-grey, the next three black, and the two exterior ones with a white spot on the inner web. *Female*, with the head and upper parts oil-green; cheeks and below grey with a tinge of red. —Pairs in March. Nest in trees, of moss or lichens, lined with feathers and hair. Eggs 5, bluish-white, with reddish spots. *Young* like the female.—Sexes separate into distinct flocks during the winter.

103. F. *montifringilla.* Mountain-finch. — Head, cheeks, nape, and upper parts of the back black; throat, breast, and shoulders reddish-orange.

Will. Orn. 187. *Linn.* Syst. i. 318. *Penn.* Brit. Zool. i. 337. *Temm.* Orn. i. 360.—A common winter visitant.

Length 6½, breadth 10½ inches; weight 1¾ ounces. Bill yellowish, tip black, with an indistinct terminal notch. Feet brown. Irides dusky. Covers of the primaries black; the three first quills black. Tail black, the two middle ones with reddish margins. The *female* has the crown reddish, with a black band above the eyes.—Nest on fir-trees. Eggs 5, white, with yellowish spots. Breeds in the north of Europe.—Frequents this country in winter, visiting the corn-yards along with chaffinches. The bright gamboge-yellow at the setting on of the wing is an obvious characteristic mark. It seems to vary in colour with the season, becoming whiter in severe winters.

104. F. *cannabina.* Brown Linnet.—Bill bluntly conical; wing-covers brown.

Linaria rubra major, *Will.* Orn. 191. *Sibb.* Scot. 18.—F. can., *Linn.* Syst. i. 322.—Red-headed Linnet, *Penn.* Brit. Zool. i. 343.—Fr. can. *Temm.* Orn. i. 364.—*E*,, Great Red-pole; *S*, Grey Lintie; *W*, Linbengoch.—Common.

Length 6, breadth 10 inches; weight an ounce. Bill, strong in proportion as the Green Grosbeak, but the ridge is sharper; bluish-grey, dark at the tip. Legs and feet brown. Irides hazel. Front and breast carmine-red, throat yellowish-white streaked with brown; crown, nape, and sides of the neck bluish-grey: above, chesnut-brown with pale edges; below, white with a rufous tinge. The first quill black; the following ones edged with white on both webs, forming a lengthened white mark on the wings. The quills increase in bluntness to the seventh, after which they are emarginate. Tail forked, black, the feathers margined on both sides with white, except the two middle ones. The *female* has the plumage brown, with pale edges, the white on the wing and tail less, and the belly more inclining to reddish-brown, and in wanting the carmine-red on the front and breast.—Nest in furze and low shrubs, of moss and grass, lined with hair. Eggs 5, bluish-white, speckled with purplish-red. *Young* like the female. In winter, the male resembles the female, although the carmine tinge may be observed upon lifting up the feathers on the front and breast.—It congregates in large flocks during the winter season.

105. F. *montium.* Mountain-Linnet. — Bill triangular; greater wing-covers edged with white.

Linaria vulgaris, *Will.* Orn. 190.—Twite, *Penn.* Brit. Zool. i. 346.—Frin. mon. *Temm.* Orn. i. 368.—*W*, Llinos fynydd.—Common in England, rare in Scotland.

Size of the preceding, or larger. Bill wax-yellow. Feet black. Irides hazel. Throat, sides of the head and neck pale reddish-brown; crown, nape, and back black, with red margins. Rump purplish-red. Quills dusky, the primaries margined with pale brown, the secondaries with white on their outer webs. Tail brownish-black, margined with white. *Female* wants the red rump, and the whole plumage has less black and more brown.—Nest in heath, of dry grass, lined with wool. Eggs 5, bluish-green, spotted with orange brown.—Gregarious in winter. Frequently taken by the London bird-catchers, and called by them Twite.

106. F. *Linaria.* Rose Linnet.—Bill acuminated, pointed. Lesser and greater wing-covers tipped with white.

Linaria rubra minor, *Will.* Orn. 181.—F. Lin., *Linn.* Syst. i. 322.—Less Red-headed Linnet, *Penn.* Brit. Zool.—F. Lin., *Temm.* Orn. i. 373.—*E*, Stone Redpole; *S*, Rose Lintie; W, Llinos bengoch leif; *G*, Gealan Lin.—Not rare.

Length 5, breadth 8½ inches. Irides hazel. Bill yellow; tip and ridge dusky. Front, lores, and chin black. The head, neck, breast, sides and rump crimson. Back black, with brown edges. Belly white. Quills and tail dusky, edged with yellowish-brown. *Female*, has the rump brown, with black stripes, and the crimson only on the head. The sides of the throat, breast, and belly, white. The sides with dusky stripes.—Nest in low trees, of moss, lined with the down of plants. Eggs 5, bluish-green, spotted wtih orange-brown. *Young*, like the female.—This species is a winter visitant of the south of England; but, in the north, and in Scotland, it is chiefly stationary.

107. F. *spinus.* Siskin.—Head, above, black. The neck, breast, and rump lemon-yellow.

Spinus, *Will.* Orn. 192.—F. sp., *Linn.* Syst. i. 322. *Penn.* Brit. Zool. i. 340. *Temm.* Orn. i. 371.—*E*, Aberdavine;—Y Ddreiniog.—A winter visitant.

Size of the rose-linnet. Bill similar in shape, and having likewise the two basal processes on the margin of the lower mandible. Legs brown. Feet dusky. Back siskin-green; dark in the middle of the feathers. Belly white. Wing-covers black, tipped with yellowish-white. Quills black; the outer ones with a yellowish-green margin; the inner ones with the outer web all yellowish-white at the base, and edged with a paler border at the tip. Tail, with the two middle feathers dusky, with pale margins; the rest, with the basal half white; the ends, and outer web of the exterior one dusky. The *female* wants the black mark on the head; the yellow has a greenish tinge mixed with grey; and the belly has dusky stripes.—Nest in pine-trees. Eggs 5, greyish-white, spotted with purple.—This bird breeds in the north of Europe, and visits Britain in rather an irregular manner. They may sometimes breed here; as, in 1824, I received from Mr Esplin, a male and female, shot from a flock in the first week of April.

108. F. *carduelis.* Gold-Finch.—Forehead, temples, and throat, arterial blood-red. Base of the bill, lores, crown, and nape, black.

Carduelis, *Will.* Orn. 189. *Sibb.* Scot. 18.—F. car., *Linn.* Syst. Nat. i. 318. *Penn.* Brit. Zool. i. 332. *Temm.* Orn. i. 376.—*S*, Goldspink; *W*, Gwas y sierri.—Common.

Length 5½, breadth 9½ inches; weight half an ounce. Bill, in the form of a lengthened cone; yellowish-white, with a dusky tip. Irides brown. Legs dusky. Cheeks, ear-covers, and lower parts of the neck, white. Back and breast yellowish-brown. Lesser wing-covers black. Greater covers and basal half of the quills gamboge-yellow; the other half black, with a white spot at the tip. Tail black, the six middle feathers tipped with white, the others, with an oval white spot on the outer web. The *female* less bright in the colours. —Nest in shrubs, of lichens and moss, lined with vegetable down and hair. Eggs 5, bluish-white, with orange spots.—The food of this species consists of the seeds of thistles and similar plants. In winter it is gregarious, but the flocks are small.

The Fringilla Canaria, or Canary, has been long reared in this country. It breeds freely in confinement, and is highly prized for its song *.

Gen. XLVII. STURNUS. Starling.—Bill slightly subulate; depressed at the point, with the nostrils partly closed by a prominent rim.

109. *S. vulgaris.* Common Starling.—Plumage black, with purple reflections, the feathers tipped with triangular white spots.

Will. Orn. 144. *Sibb.* Scot. 17. *Linn.* Syst. i. 270. *Penn.* Brit. Zool. i. 299. *Temm.* Orn. i. 132.—*W*, Dreydwen, Drydwy.—Generally distributed.

Length 8¾, breadth 16 inches; weight 3½ ounces. Bill yellow. Feet brown. Irides hazel. Quills and tail dusky, with pale reddish brown margins. *Female*, has the bill less yellow, and the white spots more numerous.—Nest in the hole of a tree or wall, of dry grass. Eggs 5, bluish-green. *Young*, of a uniform hair-brown colour, constituting the Passer solitarius of Willoughby, Orn. 140., and the Solitary Thrush of Montagu.—This bird is most numerous near the coast, and seems to execute irregular migrations. It abounds in the Orkney and Zetland Isles.

Gen. XLVIII. GARRULUS. Jay.—Bill lengthened, hooked. Crown feathers long, and capable of erection.

110. G. *glandarius.*—Black mustaches. Chin, breast, belly, and rump white. The greater wing-coverts barred with blue and black.

Pica glandaria, *Will.* Orn. 88. *Sibb.* Scot. 15.—Corvus gland. *Linn.* Syst. i. 156. *Penn.* Brit. Zool. i. 220. *Temm.* Orn. i. 114.—*S*, Jay-piet; *W*, Screch y coed.; *G.* Scriachag choille.—In woods, but not numerous.

Length 14, breadth 21½ inches; weight 7 ounces. Bill black. Legs brown. Irides grey. Head white, with black streaks. Nape, back, and shoulders brownish purple red. Primaries dusky, the outer webs grey. Six of the secondaries black, the outer webs bluish-white at the base, the two next black. Tail black. *Female* similar.—Nest in thickets or trees, of sticks, lined with fibrous roots. Eggs 5 or 6, of a pale blue, blotched with brown.—The jay is omnivorous, docile, and possesses strong powers of imitation. Confined to woody districts.

Gen. XLIX. PICA. Magpie.—Bill hooked. Tail long and wedge-shaped.

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* Those who wish for accurate information respecting the rearing of small birds, may consult, with advantage, "A Treatise on British Song-Birds," by Mr Sime, in 1 vol. 8vo. Edin. 1823.

111. *P. caudata.* Common Magpie.—Above and the breast black; scapulars and belly white.

Will. Orn. 87.—*Sibb.* Scot. 15.—Corvus pica, *Linn.* Syst. i. 157. *Penn.* Brit. Zool. i. 225. *Temm.* Orn. i. 115.—*E*, Pianet, Madge; *S*, Piet; *W*, Piogen; *G*, Pioghaid.—Common.

Length 18, breadth 24 inches; weight 9 ounces. Bill and legs black. Irides dark-brown. Gular feathers loose. Wings with purple reflections. Central parts of the inner webs of the quills white. The first quill short. Tail black, iridescent. The two middle feathers equal. The others rapidly decreasing in length to the exterior ones. *Female* similar, but less.—Nest in trees, woven with sticks all round, the entrance at the side; plastered within at the bottom, and lined with dry grass. Eggs 6 to 8, yellowish-white, spotted with brown and grey.—When taken young this bird is easily tamed. It is omnivorous, usually in pairs, and is clamorous on the approach of danger.

GEN. L. CORVUS. CROW.—Bill strong, ridge bent. Tail rounded.

* *In single pairs in the breeding season.*

112. C. *Corax.* Raven.—Plumage black, glossed with blue. Throat-feathers narrow, raised, acuminated; those of the hind-neck long, loose, and silky. Tail much rounded.

Corvus, *Will.* Orn. 82. *Sibb.* Scot. 15.—Cor. Cor. *Linn.* Syst. i. 155. *Penn.* Brit. Zool. i. 218. *Temm.* Orn. i. 107.—*E* and *S*, Corby; *W*, Cigfran; *G*, Fitheach.—Common in hilly districts.

Length 25, breadth 48 inches; weight 34 ounces. Bill and legs black. Irides of two circles, the outer brown the inner grey. Tail more than half the length of the body. *Female* similar.—Nest in high trees or rocks; of sticks, lined with wool. Eggs 5, oil-green, with brown and grey spots. The *young* are easily tamed.—This species feeds on carrion, and will kill lambs and weakly sheep, beginning its work by picking out their eyes. It abounds in the Hebrides.

113. C. *corone.* Carrion Crow.—Plumage black. Throat-feathers small, narrow, adpressed, the barbs loose at the margins. Tail slightly rounded.

Cornix, *Will.* Orn. 83.—Corvus minor, *Sibb.* Scot. 15.—C. cor. *Linn.* Syst. i. 155. *Penn.* Brit. Zool. i. 219. *Temm.* Orn. i. 108.—*E*, Black Neb, Flesh Crow, Gor Crow, Midden Crow; *W*, Bran dyddyn.—Common.

Length 19½, breadth 26 inches; weight 10 ounces. Bill and legs black; irides hazel.—Nest on trees, of sticks, lined with hair and wool. Eggs 5, oil-green, with brown and grey spots. Omnivorous.—Is this species different from the Hooded Crow?

114. C. *Cornix.* Hooded Crow.—Head, throat, wings, and tail black, with blue and green reflections. Neck and the rest of the body smoke-grey. Tail rounded.

Cornix cinerea, *Will.* Orn 84. *Sibb.* Scot. 15.—C. Cor. *Linn.* Syst. i. 156. *Penn.* Brit. Zool. i. 223. *Temm.* Orn. i. 109.—*E*, Royston Crow, Dun Crow, Greybacked Crow, Bunting Crow; *S*, Hoody; *W*, Bran yr Jwerddon; *G*, Fionnag.—Common.

Length 20, breadth 39 inches; weight 22 ounces. Bill, smooth, black, with the tip pale. Irides greyish-brown. *Female* wanting the grey.—Nest, in trees or rocks, of sticks or straws, lined with wool. Eggs 5, like those of the Carrion Crow. *Young* like the female.—Feeds on carrion, eggs, and young poultry. Said to be migratory in England. Stationary in Scotland, and even in Zetland.—The grey colour seems to become whiter and more obvious in a severe winter.

** *Gregarious in the breeding season.*

115. C. *Monedula.* Jackdaw.—Head black; nape smoke-grey. Back greyish-black. Tail little rounded.

Monedula, *Will.* Orn. 85. *Sibb.* Scot. 15.—C. Mon. *Linn.* Syst. i. 156. *Penn.* Brit. Zool. i. 230. *Temm.* Orn. i. 111.—*E*, Daw; *S*, Kae; *W*. Cogfran; *G*, Cathag.—Common near old ruins.

Length 14, breadth 28½ inches; weight 9½ ounces. Bill and legs black; irides greyish-white. Ear covers large. Wing covers and secondaries black, glossed with violet. Beneath, bluish-black. The *female* has less grey.—Nest in old buildings, of sticks, lined with grass and wool. Eggs 5, greenish-blue, spotted with blackish brown.—Food consists of grain, worms, and insects. Congregates in winter with rooks.

116. C. *frugilegus.* Rook.—Bill nearly straight; the skin at the baze naked and scurfy.

Will. Orn. 84.—Spermologus frugivorus, *Sibb.* Scot.—Cor. fr. *Linn.* Syst. i. 156. *Penn.* Brit. Zool. i. 221. *Temm.* Orn. i. 110.—*S*, Craw; *W*, Ydfran; *G*, Creumhach, Rocus,—In old woods near houses.

Length 20, breadth 38 inches, weight 19 ounces. The naked skin at the base of the bill is covered in youth with the deflected bristles, but which are rubbed off by the act of digging in the earth for food.—Nest on old trees, of sticks lined with fibrous roots. Eggs 5, bluish-green, with dark blotches.—Birds of this species frequent the same rookery, and are always gregarious.

As connected with this group of birds, two species deserve to be noticed as stragglers.

1. *Caryocatactes nucifraga.* Nutcracker.—*Will.* Orn. 90. *Penn.* Brit. Zool. ii. 625.—Nucifraga Car. *Tem.* Orn. i. 117. *Selby's* Ill. 84.—It is noticed by Pennant as having been killed near Moyston, Flintshire, 5th October 1753; and has subsequently been found in Kent, Northumberland, and one or two other places.—Common on the Continent in flocks. Solitary individuals only have strayed hither.

2. *Coracias garrula.* Roller.—Garrulus argentoratinsis, *Will.* Orn. 89.—Cor. gar. *Penn.* Brit. Zool. ii. 624. *Temm.* Orn. i. 127. *Selby's* Ill. 86.—An example of this bird is mentioned by Pennant as having been shot in Cornwall; and another at Dunkeld, according to Mr Selby, which is now in the Edinburgh Museum.—Common on the Continent.

Gen. LI. CERTHIA. Creeper.—Bill triangular, compressed, subulate, curved. Hind claw large.

117. C. *familiaris.* Common Creeper.—Plumage, above, yellowish-brown, intermixed with black, brown and white. Rump reddish.

Will. Orn. 100. *Linn.* Syst. i. 184. *Penn.* Brit. Zool. i. 260. *Temm.* Orn. i. 410.—*S*, Tree speeler; *W*, Y Grepianog.—In woods.

Length 5, breadth 7½ inches; weight 2 drams. Bill with the upper mandible dusky, the lower yellowish-white. The tongue with a hard point. Irides hazel. Above the eyes a white streak. Belly white. Quills 18, the first 4 dusky, the rest having a broad reddish-white band in the middle, the tips white. Tail of 12 feathers, stiff and acuminated. *Female* smaller.—Nest in the holes of trees, of grass, lined with feathers. Eggs 7 or 9, white, speckled with reddish-brown.—Food consists of small insects, which it finds in the crevices of the bark of trees, on the stems of which it runs in every direction readily.

GEN. LII. PYRRHOCORAX. (FREGILUS *of Cuvier.*) CHOUGH.—Bill slender, arched, subulated, and pointed. Tail-feathers 12.

118. P. *Graculus.* Cornish Chough.—Bill, legs, and toes orange; claws black.

Coracias, seu Pyrr. *Will.* Orn. 86. *Sibb.* Scot. 15.—Corvus gr. *Linn.* Syst. i. 158. *Penn.* Brit. Zool. i. 228. *Temm.* Orn. i. 122.—*E*, Cornish Daw, Killegrew; *W*, Bran big goch.—Inhabits the western side of the island.

Length 17, breadth 33½ inches; weight 12½ ounces. Irides yellowish-brown. Plumage black, glossed with purple. Wings as long as the tail. *Female* less.—Nest on sea cliffs or old towers near the coast, of sticks, lined with wool. Eggs 5, white, spotted with brown.

In this, and the Garrulus Pica, and Corvus, the quill-feathers are 20, and the tail-feathers are 12 in number.

GEN. LIII.—UPUPA. HOOPOE.—Head with a crest. Bill slender, curved. Nostrils exposed. Tail of 10 feathers.

119. U. *Epops.* Common Hoopoe.—Head, neck and breast of a purplish-red colour; the wings black with fine white bands.

Upupa, *Will.* Orn. 100. *Sibb.* Scot. 16. *Linn.* Syst. i. 184. *Penn.* Brit. Zool. 1. 257. *Temm.* Orn. i. 415.—*W*, Y Goppog.—A rare summer visitant.

Length 12¼, breadth 19 inches; weight 3 ounces. Bill black, reddish towards the base; the tongue small, triangular and acute. Irides umber-brown. Back pale brocoli-brown, tinged with grey, and with black and white bands at the lower part. Tail black, with a V-shaped mark of white. Beneath white. Crest, 2 inches long, of two rows of produced feathers, above 20 in number, orange-brown, tipped with black, and of unequal length, which it erects upon being alarmed. *Female* with a smaller crest.—Nest in the holes of decayed trees or walls, of grass lined with feathers. Eggs fine greyish-white, spotted with brown.—This species has been found occasionally from Orkney (Wallace's Ork. 48.) to Devonshire (Mont. Orn. Dict.), and has even attempted to breed. It is frequent in France and Germany, as a summer visitant.

GEN. LIV. ALCEDO. KING'S-FISHER.—Bill straight, angular, pointed. Tarsus short.

120. A. *Ispida.* Common King's-fisher.—Under and behind the eye a brown band ending at the side of the nape in white.

Ispida, *Will.* Orn. 101. *Sibb.* Scott. 16.—A. Isp. *Linn.* Syst. i. 179. *Penn.* Brit. Zool. i. 246. *Temm.* Orn. i. 423.—*W*, Glas y dorlan.—Not common.

Length 7, breadth 11 inches; weight 1¼ ounce. Bill blackish-brown; tongue short, broad and pointed; mouth orange. Plumage, above, bluish-green, marked on the head and shoulders with azure blue, the last colour uniform on the back and rump. Chin white, beneath orange-brown. Quills 23, the third the longest. Tail short, of 12 feathers. *Female* more tinged with green.—Nest in holes in clay banks, of pellets of ejected fish-bones. Eggs 6, transparent pink-white. Food consisting of small fishes.—This bird frequents clear gravelly rivers, edged with willows and alders.

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As a straggler, the following species merits a place.

Merops Apiaster. Bee-eater.—An individual was shot at Mattishall in Norfolk, a notice of which was communicated to the Linnean Society, 2d July 1794, by the Rev. George Smith: "A flight of about twenty was seen in June, and the same flight, probably (much diminished in numbers), was observed passing over the same spot in October following." Linn. Trans. 111. 333. Sowerby's Brit. Misc. Tab. lxix.

SCANSORES.

I. *Gape wide; tongue short.*
   Cuculus.

II. *Gape narrow; tongue long.*
   Picus.
   Yunx.

GEN. LV. CUCULUS. CUCKOO.—Bill slightly arched. Nostrils round, margined by a naked prominent membrane.

121. C. *canorus.* Common Cuckoo.—Back, breast, neck, and head deep bluish-grey; belly, thighs, and under tail-covers white, with transverse black bars.

Will. Orn. 62. *Sibb.* Scott. 15. *Linn.* Syst. i. 168. *Penn.* Brit. Zool. i. 232. *Temm.* Orn. i. 381.—*S*, Gowk; *W*, Cog; *G*, Cuthag, Cuach.—A summer visitant.

Length 14, breadth 25 inches; weight 5 ounces. Bill blackish-brown, yellowish at the base; inside of the mouth orange-red. Irides and feet yellow. Nostrils round, open and prominent. Plumage deep bluish-grey, the belly white with transverse black bars. Inner webs of the quill-feathers with oval white spots. Tail of 10 feathers, of unequal length, the two middle ones black, tipped with white; the others, black with white spots. *Female* like the male.—Nest seldom constructed by the cuckoo itself, the eggs being generally dropped, separately, into the nests of the hedge-sparrow, wagtail, titlark, yellow-hammer, greenfinch, or whinchat, in the temporary absence of their owners. In some cases, however, it appears that the cuckoo constructs its own nest. Thus, in a manuscript of Derham's on Instinct, communicated by Pennant to Barrington, it is stated, that "The Rev. Mr Stafford was walking in Glossopdale, in the Peak of Derbyshire, and saw a cuckoo rise from its nest, which was on the stump of a tree, that had been some time felled, so as much to resemble the colour of the bird. In this nest were two young cuckoos, one of which he fastened to the ground, by means of a peg and line, and very frequently, for many days, beheld the old cuckoo feed there her young ones."—Phil. Trans. 1772, 299. The egg, which varies in colour and markings, is deposited in the nest of the dupe dame, after she has laid one or two eggs. When the young cuckoo is hatched, it becomes restless, and ceases not until it has ejected from the nest the eggs or young of its foster-parent. It is fed by the dupe with maternal care, until able to provide for itself. (See Jenner, Phil. Trans. 1788, p. 219.) When in a young state, the irides are liver-brown, the plumage brown with dark spots; the feathers on the forehead margined with white; beneath, yellowish-white, with transverse black bars. In this state, or before acquiring the plumage of maturity, it has been termed *Cuculus hepaticus.*—The food of the cuckoo consists of insects, especially caterpillars, both smooth and hairy. It arrives in April. The old ones depart in the beginning of July, and the young, hatched at or before that period, seem to leave us in succession.

GEN. LVI. PICUS. WOODPECKER.—Bill long, straight, angular and compressed; nostrils covered by deflected bristles; the first quill short; the tail-feathers stiff and pointed.

122. P. *viridis.* Green Woodpecker.—Plumage, above, green; beneath, grey; the crown red.

Will. Orn. 93. *Sibb.* Scot. 15. *Linn.* Syst. i. 175. *Penn.* Brit. Zool. i. 240. *Temm.* Orn. i. 391.—*E*, Rain-fowl, High-hoo, Hew-hole, Awl-bird, Yappingall, Yaffer, Popinjay; *W*, Cnocell y coed, Delor y drew; *G*, Lasair choille.—In wooded districts.

Length 13½, breadth 21½ inches; weight 7 ounces. Bill black; irides grey; feet greenish. Feathers at the base of the bill, and around the eyes black. Lower part of the back and rump gamboge-yellow. Quills 19, barred with dusky black and yellowish-grey. Tail-feathers 10, with green and brown bars. *Female*, with less red on the head and black round the eyes, and the mustaches (which in the male are red) are black.—Nest in the holes of trees. Eggs 5, bluish-white. *Young* with little red on the head, the plumage inclining to grey, with spots of that colour on the back. The mustaches are spotted with black and white.

123. P. *major.* Greater spotted Woodpecker.—Plumage, above, black; scapulars, and beneath, white.

Will. Orn. 94. *Linn.* Syst. i. 176. *Penn.* Brit. Zool. i. 243. *Temm.* Orn. i. 395.—*E*, Whitwall; *W*, Delor fraith.—In wooded districts.

Length 9½, breadth 12 inches; weight 3 ounces. Bill black; irides red; feet dark grey. Front grey, crown black, the nape crimson. Cheeks and ear-covers white. A black stripe from the gape to the nape, with a branch descending on the neck. A white patch on each side of the hind neck. Quills 20, black, with white spots. Tail-feathers 10, the four middle ones black, the rest white with black spots. Vent crimson. The *female* wants the red on the nape.—Nest, a hole in a decayed tree. Eggs 5, bluish-white. The *young* have the front grey, the crown red, and the nape black; the plumage above with a brownish tinge, and beneath with black dots. In this state it is the

Middle-spotted Woodpecker of British writers.—The jarring noise made by the woodpeckers, especially during the breeding season, is produced by repeated strokes of the bill on the dead branch of a tree.

124. P. *minor.* Lesser-spotted Woodpecker.—Upper part of the back and rump black; the middle and scapulars white and black; beneath greyish white.

Will. Orn. 94. *Sibb.* Scot. 15. *Linn.* Syst. i. 176. *Penn.* Brit. Zool. i. 245. *Temm.* Orn. i. 399.—*E*, Hickwall, Crank-bird; *W*, Delor fraith beiaf.—Frequents the south and west of England.

Length 6, breadth 12 inches; weight not an ounce. Bill and legs grey; irides red. Front grey, crown red, nape and stripe over the eye black. The cheeks and sides of the neck white. From the gape a stripe of black descends to the shoulders. Quills and tail-feathers black, with white spots. *Female* destitute of the red on the crown, its place supplied with white.—Nest in trees. Eggs 5, purplish-white.—Sibbald records this species, probably by mistake, as Scottish.

STRAGGLERS.

1. P. *martius.* Great Black Woodpecker.—In this species, which is 18 inches long, and 29 broad, and upwards of 10 ounces in weight, the plumage is black, with the exception of the crown, which is of a bright red. Quills 19; tail-feathers 10. This bird was unknown to Willoughby as a British species. Dr Pulteney, in his Catalogue of the Birds of Dorsetshire, says, "Shot in the nursery garden at Blandford; also at Whitchurch, and other places in Dorsetshire," p. 6. Montagu, in his Supplement to the Orn. Dict., adds, "Lord Stanley assures us, that he shot a Picus martius in Lancashire; and we have heard that another was shot in the winter of 1805, on the trunk of an old willow tree in Battersea Fields." There is no evidence, however, of its breeding here, or even performing annual visits.

2. P. *villosus.* Hairy Woodpecker.—In this species, which is nearly 9 inches long, and about 2 ounces in weight, the plumage, above, is black, with a white stripe of hair-like feathers down the middle of the back. The nape has a red band, and there are two white stripes on each side of the head. This bird is a native of North America. "Dr Latham mentions having seen a pair in the collection of the Dutchess of Portland, which were shot near Halifax in Yorkshire."—*Montagu.*

GEN. LVII. YUNX. WRYNECK.—Bill conical, depressed; nostrils naked. The first quill nearly equal to the second. Tail-feathers 10, soft and flexible.

125. Y. *torquilla.* Common Wryneck.—Plumage, above, yellowish-grey, mottled with brown specks and arrow-shaped black bands, with a black mesial stripe.

Will. Orn. 95. *Linn.* Syst. i. 172. *Penn.* Brit. Zool. i. 237. *Temm.* Orn. i. 403.—*E*, Long-tongue, Emmet Hunter; *W*, Gwas y gog, Gwddfro.—A regular summer visitant.

Length 7½, breadth 11 inches; weight an ounce. Bill and legs yellowish-brown. Irides hazel. Chin and throat yellowish-white. On each side of the breast a patch of wood-brown. Breast and belly white, with arrow-shaped black spots. Quills 19. Tail long, rounded. *Female* like the male.—Nest in the hole of a tree. Eggs 10, white.—This bird arrives a few days previous to the cuckoo. It is frequent in the southern and eastern counties of England, but rare in the northern ones. Mr Selby has traced it as far as Morpeth in Northumberland. Pennant inserted it in his list of Scottish Birds prefixed to Lightfoot's Flora Scotica, without mentioning a habitat. Dr Burgess, however, enumerates it among the birds of Kirkmichael (St. Ac. vol. i.)

GRALLÆ. WADERS.

I. CULTRIROSTRES. *Bill strong and sharp-edged.*
    Ardea.

II. PRESSIROSTRES. *Bill feeble, the edges more or less rounded.*
    a. *Tetradactylæ.* With a hind-toe.
        b. Toes remarkably long and flattened below. Sternum narrow. Wings short. MACRODACTYLÆ.
            c. Front covered.
                Rallus.
                Ortygometra.
            cc. Front with a naked stripe.
                Gallinula.
                Fulica.
        bb. Toes of moderate length.
            c. Toes with a developed membrane.
                d. Membrane scalloped.
                    Phalaropus.
                    Lobipes.
                dd. Membrane continuous.
                    Recurvirostra.
            cc. Membrane wanting, or abbreviated.
                d. Bill longer than the head.
                    e. Bill arched, deflected.
                        Numenius.
                    ee. Bill nearly straight.
                        f. bill slender, produced.
                            g. Nasal groove short, the extremity of the bill solid.
                                Totanus.
                            gg. Nasal groove reaching nearly to the end of the bill.
                                h. Mandible with a dorsal groove.
                                    Scolopax.
                                hh. Mandible destitute of a dorsal groove.
                                    Limosa.
                                    Tringa.
                        ff. Bill conical, short.
                            Strepsilas.
                dd. Bill shorter than the head.
                    Vanellus.
                    Squaterola.

aa. *Tridactylæ.*
  b. Bill slender.
    Calidris.
  bb. Bill strong.
    c. Bill compressed.
      d. Bill swollen at the end.
        Charadrius.
        Oidicnemus.
      dd. Bill wedged shaped.
        Hæmatopus.
    cc. Bill vaulted.
      Otis.

In no department of British Ornithology does there exist so much confusion as among the Grallæ, in reference to native species. Numerous stragglers, both from America and Europe, have been enrolled in our systematical catalogues as British subjects. Several species, which were formerly natives, but which, by the influence of civilization, have been reduced to the rank of stragglers, still maintain their place as citizens, as if their geographical distribution had experienced no check. It is surely time to reduce these redundancies, and exhibit our list of native birds freed as much as possible from foreigners. Under the influence of these feelings, I judge it unnecessary to describe formally the two following species.

1. *Glareola torquata.* Austrian Pratincole. (*Temm.* Orn. ii. 500.)—This species, which may be readily distinguished from the other British Grallæ, by its remarkably wide mouth, has twice occurred in this country. The first was shot near Ormskirk, in Lancashire, in 1807, and is now in the collection of Lord Stanley. The second was killed by Mr Bullock in Unst, the most northerly of the Zetland Isles, on the 13th August 1812.—See *Mont.* Orn. Dict. Suppt. and Lin. Trans. ix. 198. *Bullock*, Lin. Trans. xi. 177.

2. *Platea Leucorodia.* Common Spoonbill. (*Temm.* Orn. ii. 595.)—The thin, flat, enlarged extremity of the bill, is an obvious distinguishing mark of the species. It was first recorded by *Merret*, (Pinax 181.) on the authority of *Turner*, as inhabiting Lincolnshire; and by *Sibbald*, (Scot. Ill. 18.) as an accidental visitant of Scotland. He states (Auct. Mus. Balf. 195.) having received it from Orkney. It has since been noticed by *Pennant* (Brit. Zool. ii. 634.) as migrating, in a flock, into the marshes near Yarmouth, in Norfolk, in April 1774.—*Pulteney*, (Dorset Cat. 14.) records it as accidentally a visitant of Dorsetshire.—*Montagu* (Orn. Dict. Supp.) mentions one shot in March, and another in November, at King's-Bridge, Devonshire. It has likewise been shot in Zetland.

CULTRIROSTRES.

GEN. LVIII. ARDEA. HERON.—Gape extending as far back as the eyes. Nasal groove reaching almost to the end of the bill.

126. *A. cinerea.* Common Heron.—Plumage bluish-grey. Middle toe with the claw much shorter than the tarsus.

Will. Orn. 203.—*Sibb. Scot.* 18.—*Linn.* Syst. i. 236.—*Penn.* Brit. Zool. ii. 421.—*Temm.* Orn. ii. 567.—*E*, Heronshaw; *S*, Craiged Heron; *W*, Cryr Glâs; *G*, Corra riathach; *N*, Hegrie.—Common.

Length 3⅓, breadth 5⅓ feet; weight upwards of 3 pounds. Bill nearly 6 inches long, dusky; the under yellow. Irides yellow. Legs greenish. Tarsus plated in front, but reticulated towards the toes. Tip of the tongue subulate. Crest black. Long feathers on the neck, next the breast, and on the shoulders. Front, neck, and belly white. Sides, and stripes on the neck in front, black. A singular patch of concealed soft feathers on the breast. The third feather in the wing longest. Inner web of the three first abbreviated near the end. Tail-feathers 12 in number. Willoughby and Cuvier state that this species has only one cœcum. I have observed two, both short. *Female*, when old, like the male. Gregarious in the breeding season, in *heronries.*—Nest, on trees, of sticks, lined with wool. Eggs 4 or 5, of a greenish-blue colour, and about the size of those of a duck. The *young* are destitute of the crest, and the long-feathers on the scapulars and neck.—This species feeds on fish, and is particularly destructive to those in ponds.

127. *A. stellaris.* Bittern.—Plumage yellowish-red, with black spots and bars. The cheeks and crown black.

Will. Orn. 207.—*Sibb.* Scot. 18.—*Linn.* Syst. i. 239.—*Pen.* Brit. Zool. ii. 424.—*Temm.* Orn. ii. 580;—*E*, Miredrum, Dumbycoss, Butterbump; *S*, Buttour, Bogjumper, Bogblutter; *W*, Aderyn y bwnn, Bwmp y Gors.—Near extensive fens, but not common.

Length 2½ feet. Bill four inches long, brown, the lower mandible and edge of the upper, together with the space round the eyes, and the feet, greenish yellow. Irides yellow. The feathers on the nape, neck, and breast long and loose. Quills and greater covers regularly barred with black. Tail short, of 10 feathers. *Female*, less, with the plumage less bright, and the neck feathers shorter.—Nest in marshes, of reeds. Eggs 5, olive-green.—Preys on fish and reptiles. In the breeding season, makes a loud bellowing noise. It has disappeared from many districts where formerly it abounded, and is daily becoming scarcer.

STRAGGLERS.

1. *A. Egretta*, *Temm.* Orn. ii. 572.—To this species, it is probable that the Ardea alba major of Willoughby (Orn. 205.) observed in this country by Johnston, and termed by Merret, (Pinax 181.) a *Mire Drumble*, must be referred. Montagu states, on the authority of Latham, that it has been killed in Cumberland, and that it has likewise been once supposed to have been seen in Devonshire. The individuals seen in Britain appear either to have been young birds, or old ones in moult, in which state they are destitute of the elongated soft feathers of the head and back.

2. *A. Garzetta. Temm.* Orn. ii. 57.—This is supposed to be the species, a thousand individuals of which were served up under the name of *Egrittes*, at the celebrated feast of Nevil, Bishop of York, in the reign of Edward IV. It is possible, however, that the lapwing may have been there referred to, as the most common bird with a crest. On the supposition that this heron was the bird alluded to, it will be difficult to account for the silence of Willoughby and Ray, in regard to this species being a native of Britain. Merret (Pinax 182.) probably refers to this species, as having been sent to him from Wilton. Pennant (Brit. Zool. ii. 631.) once received feathers from Anglesea, which he suspected to belong to this bird.

3. *A. purpurea. Temm.* Orn. ii. 570.—This species, in its immature state, is the Ardea Caspica, or African Heron, of British writers. A specimen of this bird in the Leverian Museum, was stated to have been shot in Ashdown Park, near Lambourn, Berks. The late Mr Montagu, in a letter dated 6th January 1814, informed me, "I have just received from a friend a fine specimen of African Heron, shot in Norfolk." It must, however, be regarded as one of our rarest stragglers.

4. *A. nycticorax.* Night Heron. *Temm.* Orn. ii. 577.—A specimen shot near London, in May 1782, existed in the Leverian Museum, according to Montagu, who likewise states, (Supp. Orn. Dict.) on the authority of Lord Upper Ossory, that another was shot on the Ouse, near Ampthill, in 1791. Bewick mentions another in the Wycliffe Museum, from which his figure was taken, (Brit. Birds, ii. 44.) In the immature plumage, this species is the *A. Gardeni* of British writers; in which state it was shot by Lord Kirkwall, as it sat upon a tree, near Thame, in Oxfordshire. (Reverend Mr Dickinson, in Linn. Trans. v. 276, and Montagu, Supp. Orn. Dict.)

5. *A. ralloides.* Sguacco Heron. *Temm.* Orn. ii. 2. 81.—This species is the *A. comata* of British writers. An individual was shot at Boyton, in Wiltshire, by Edward Lambert, Esq. in the year 1775 (Linn. Trans. iii. 335.). Another, according to Mr J. Youell, of Yarmouth, was taken on the 20th July 1820, in a net, at Ormsby, in Norfolk. (Linn. Trans. xiii. 617.) The Freckled Heron, *A. lentiginosa*, described by Montagu, in the Supplement to the Ornithological Dictionary, shot at Piddletown, Dorsetshire, by Mr Cunningham, is probably an immature bird of this species. Lest this should not prove to be the case, it is considered expedient to give its description in detail. Temminck appears to regard it as synonimous with A. minor of Wilson's Am. Orn. tab. 65. f. 3. and A. "The length is about 23 inches. Bill $2\frac{3}{4}$ inches long to the feathers on the forehead, rather slender, and both mandibles equally turned to form the point; the upper part of the superior mandible dusky; sides and lower mandible greenish-yellow. The head is very small; the colour is chocolate-brown, shaded to a dull yellow at the nape, where the feathers are much elongated; the chin and throat white, with a row of brown feathers down the middle; at the base of the lower mandible, commences a black mark that increases on the upper part of the neck, on each side, and is two inches or more in length; the cheeks are yellowish, with an obscure dusky line at the corner of the eye; the feathers on the neck are long and broad, with their webs partly unconnected; those in front are pale-yellow, with broad chesnut streaks formed by each feather having one web of each colour, margined, however, with dull-yellow on the chesnut-side; some feathers have the dark mark in the middle, especially the lower ones: these are all loose, as in the common bittern; those at the bottom of the neck 4 inches long, and hang pendant below the breast: the hind neck is bare; and the feathers that fall over that part are pale yellow-brown; the feathers on the breast are also long, and of a fine chocolate-brown, glossed with purple, and margined with dull-yellow; belly and sides the same, but not quite so bright, the brown marks becoming speckled; the vent and under tail-coverts yellowish-white. The back and scapulars are chocolate-brown, with paler margins, minutely speckled, and glossed with a tinge of purple in some particular lights. The covers of the wings dull-yellow; darkest in the middle of each feather; the margins prettily speckled; the first and second order of quills, their greater

coverts, and the *alulæ spuriæ*, dusky-lead colour, with a cinereous dash; the primaries very slightly tipped with brown; the secondaries and the greater coverts tipped more deeply with the same, and prettily speckled on the light part; the tertials correspond with the lower order of scapulars, which have their margins chesnut, with small dusky lines and spots: the tail is short, and in colour similar to the tertials: the wings, when closed, do not reach to the end of the tail: the legs are 3¾ inches in length, from the heel to the knee: the toes long and slender, the middle one, including the claw (which is ¾ths of an inch in length, and pectinated on the inner side), is as long as the leg; the claws are not much hooked, but the hind one most so, and by far the longest; their colour dusky-brown. The colour of the legs, and bare space above the knee (which last is about an inch), appears to have been greenish."—*Montagu.*

6. *A. minuta.* Little Bittern.—*Temm.* Orn. ii. 584.—Pennant states, that an individual of this species was shot, as it perched on a tree in the Quarry at Shrewsbury, on the banks of the Severn, (Brit. Zool. ii. 633). Another was shot at Sanda, Orkney, 1805, by Mr Strang at Lopness. A third, as stated by Montagu (Supp. Orn. Dict.), was shot contiguous to the river Credey, in Devonshire, in the month of May 1808.

7. *A. æquinoctialis* of Latham.—*A. russata* of Temminck (Orn. ii. 566.)—A single individual of this species, a female, was killed, according to Montagu (Lin. Trans. ix. 197.), near Kingsbridge, Devonshire, the latter end of October 1805.

8. *A. Cayanensis*, (Latham).—A single individual of this species was taken near the walls of the town of Yarmouth, 24th May 1824, a notice of which was communicated to the Secretary of the Linnean Society, by Mr J. Youell.—*Linn. Trans.* xiv. 588.

9. *Grus cinerea.* Common Crane.—Merret (Pinax, 183.) notices this species among his English animals, without a remark. Willoughby (Orn. 200.), states, that they frequently visit this country, and that numerous flocks, *during summer*, haunt the fens of Lincoln and Cambridge, but he had not evidence of their breeding there. Ray, however, when referring to the same bird, states their visits as occurring in the *winter season*, (Syn. Av. 95.). As this bird breeds in more northern regions, its visits here must either be in the course of its polar or equatorial migrations; *i. e.* in spring and autumn, or during winter.—Lesley (De Origine, Moribus et Rebus gestis Scotorum, p. 25.) speaks of cranes as common (*Grues plurimi*) in Scotland; and Sibbald (Scot. Ill.) adds, that they sometimes visit Orkney.—In more modern times, the visits of this species have been rare indeed. Pennant mentions a single instance of an individual shot near Cambridge (Brit. Zool. ii. 629.). A small flock appeared, during harvest, in 1807, in Tingwall, Zetland, as I was informed by the Rev. John Turnbull, the worthy minister of the parish, who added that they fed on grain.

10. *Ciconia alba.* White Stork.—*Temm.* Orn. ii. 560.—Merret (Pinax, 181.), Willoughby (Orn. 210.), and Ray (Syn. Av. 97.), agree in considering this bird as a rare visitant of this country. Pennant takes no notice of the bird. Montagu mentions (Supp. Orn. Dict.) one killed at Sandwich, Kent, in 1805, and another in Hampshire, in the autumn of 1808.

11. *C. nigra.* Black Stork.—*Temm.* Orn. ii. 561.—This bird has only occurred once in this country, so as to come under the notice of the naturalist. It was secured after a slight wound, at Stoke St Gregory, Somersetshire, 13th May 1814, and, fortunately for science, was conveyed to Mr Montagu. In his possession, its manners, and the progress of its moulting, were carefully observed.—*Linn. Trans.* xii. 19.

12. *Psophia crepitans.*—A single example of this bird occurred in Surrey. According to the notices communicated by Lord Stanley to Montagu, (Supp.

Orn. Dict., Article *Grosbeak*), it was " in the habit of attending a farmer's yard, whither it had come of itself, and associated with his poultry."

PRESSIROSTRES.

GEN. LIX. RALLUS. RAIL.—Bill produced, longer than the head, with the under mandible even at the symphysis.

128. R. *aquaticus*. Water-Rail. — Breast ash-coloured; wings dusky, with the base white.

Will. Orn. 234. *Linn.* Syst. i. 162. *Penn.* Brit. Zool. ii. 284. *Temm.* Orn. ii. 683.—*E*, King of the Quails, Runner, Velvet-runner, Oar-cock, Bill-cock, Skiddy-cock, and Brook-owzel; *W*, Cwtiar.—Stationary.

Length 10, breadth 16 inches; weight 4 ounces. The bill is an inch and three quarters long at the gape, above and tip of the lower mandible black, the remainder of the latter and edges of the former, together with the inside of the mouth and irides, reddish-orange. Margin of the eye-lids narrow and greenish-black. The upper mandible is the longest, depressed at the base, slightly wrinkled across, with the feathers forming a projecting angle on each side. Legs dusky, bare three quarters of an inch above the knee, regularly plated in front and reticulated behind. The toes are slightly webbed at the base of the two external ones, and plated above. Plumage, above, black, each feather broadly bordered with olive-brown. The tips of the shafts of the front feathers are destitute of webs and are even a little swollen and spinous, as in the Corncrake. The chin, a spot under each eye, and the lores greyish-white. The throat, neck, and breast bluish-grey, belly orange-white; the sides black, barred with white, the tips orange. Wings dusky, the margin white, the outer webs of the quills narrow, the inner broad; the first short, the second and third longest. Tail of 12 feathers, dusky, with olive margins. The *female* has a shorter bill, and is paler in the colour.—Nest of grass, among aquatic plants. Eggs 6, white. *Young* like the female.—Food worms, slugs, insects, and snails. Runs nimbly, flirts up its tail, exhibiting the white under-covers.—Does not migrate.

GEN. LX. ORTYGOMETRA. CRAKE.—Bill conical, shorter than the head, with the under mandible forming an angle at the symphysis.

129. O. *crex*. Corncrake.—Cheeks cinereous, wing-covers reddish-chesnut.

Will. Orn. 122. *Sibb.* Scot. 16.—Rallus crex, *Linn.* Syst. 261.—Crake Gallinule, *Penn.* Brit. Zool. ii. 487.—Gallinula crex, *Temm.* Orn. ii. 686.—*E*, Daker-hen, Bean-Crake; *S*, Corn-crake; *W*, Rhegen yr yd; *G*, Gearradh-gort, Treun re treun.—A common summer visitant.

Length 11, breadth 19 inches; weight 7 ounces. Bill one inch in the gape. Upper mandible rounded above, compressed at the sides towards the base. Irides brown; the margin of the eyelids greenish-black. Legs brownish, plated before and behind, reticulated on the sides. Plumage, above, blackish-brown, each feather with a broad yellowish-brown margin. The first quill short, the second and third nearly of equal length. Tail of 12 feathers. The *female* like the male.—Nest in fields, of dry plants. Eggs 14, of a dull white, with rust-coloured spots. *Young* with colours less vivid, and the plumage mixed with white spots.—This species lives in dry places, and its muscular gizzard intimates its granivorous habits. It arrives in the end of April, and departs in October. It abounds in Orkney.

GEN. LXI. GALLINULA. GALLINULE.—Toes bordered by a simple membrane.

130. G. *chloropus.* Common Gallinule or Water-Hen.—Plumage, above, dark olive-brown; beneath, dark bluish-grey; edges of the wings and vent white.

Will. Orn. 223. *Sibb.* Scot. 19.—Fulica chloropus, *Linn.* Syst. i. 258.—Common Gallinule, *Penn.* Brit. Zool. ii. 489. *Temm.* Orn. ii. 693.—*E*, Moor-Hen, Marsh-Hen, Cuddy; *S*, Stank-Hen; *W*, Dwfriar.—Common near lakes and marshes.

Length 14, breadth 22 inches; weight 15 ounces. Bill red at the base, greenish towards the tip. Irides reddish-hazel. Legs and toes dusky-green, with a red garter above the knee. On the sides, a few white feathers. *Female* less, and the red on the bill not so conspicuous. In both, this colour fades after the breeding-season.—Nest of flags, on the stump of a tree, near water. Eggs 5 to 10, light yellowish-brown, with rusty spots.

131. G. *Porzona.* Spotted Gallinule.—Plumage, above, olive-brown, with dusky streaks and white spots; beneath, cinereous-olive with white spots.

Rallus Porzona, *Linn.* Syst. *Penn.* Brit. Zool. ii. 486.—Gal. Por. *Temm.* Orn. ii. 688.—A summer visitant.

Length 9 inches; weight 4 ounces. Bill green, base orange-red. Irides hazel. Legs green. The front, throat and cheeks cinereous, the latter with black streaks. Middle feathers of the tail edged with white; the under covers white. *Female* with brown spots on the sides of the neck.—Nest of rushes, in marshes. Eggs 7 to 12, yellowish-red, with brown and grey dots and spots. *Young* smaller in size, less spotted.—Nowhere abundant, but probably often overlooked in consequence of its shy habits.

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STRAGGLERS.

1. *G. pusilla*, *Temm.* Orn. ii. 690.—This species is about 7 inches long; the wings reach to the extremity of the tail; bill and feet bright green; back black with white streaks. This species was first recorded by Montagu, in his *Supplement* to the *Orn. Dict.*, under the title, Little Gallinule. One specimen was killed at Ashburton, in Devonshire, in 1809. Mr Fothergill likewise states (Linn. Trans. xiv. 583.), that another was shot on 6th May 1807, by John Humphrey, Esq. of Wensley, on the banks of the Yore.

2. *G. Foljambei.* Olivaceous Gallinule.—Length about 7 inches; wings reaching to half the length of the tail; bill deep green; legs flesh-coloured. Back and wings with white spots. This species was recorded by Montagu, in his Supplement, with the above trivial name, given in honour of Mr Foljambe, who detected it in a poulterer's shop, to which it had been brought from Norfolk, in May 1812. Temminck, seven years after, named it, in honour of M. Ballon, *G. Baillonii*, (Orn. ii. 692.). A second specimen occurred to Mr Plasted at Chelsea, at the same time as the one saved to science by Mr Foljambe.

Gen. LXII. FULICA. Coot.—Toes bordered by a scalloped membrane.

132. F. *atra*. Common Coot.—Head and neck black; back black, tinged with cinereous; beneath paler.

Will. Orn. 239. *Sibb.* Scot. 20. *Linn.* Syst. ii. 257. *Penn.* Brit. Zool. ii. 494. *Temm.* Orn. ii. 706.—*E*, Bald Coot; *W*, Sar ddwfr foel.—In fresh-water lakes, common.

Length 18, breadth 28 inches; weight 24 to 30 ounces. Bill flesh-coloured. Irides red. Legs greenish, the garter yellow. Tail of 12 feathers. *Female* with the frontal plate less.—Nest of flags, on the margins of lakes. Eggs 6 to 14, white, tinged and spotted with brown. *Young* with the frontal plate small, and the plumage beneath tinged with brown.—This species, though well fitted for swimming, is, according to the observations of Mr Youell (Lin. Trans. xiv. 588.), equally qualified to walk steadily, and ascends trees readily. It picks up grain quicker than domestic poultry.

Gen. LXIII. PHALAROPUS. Phalarope.—Bill slender, depressed and dilated at the extremity.

133. P. *lobatus*. Grey Phalarope.—Plumage, above, blackish-brown, the feathers bordered with orange-red; beneath brick-red.

Grey coot-footed Tringa, *Edwards*, Phil. Trans. iv. 255.—Tringa lobata, *Linn.* Syst. i. 249.—Grey Phal. *Penn.* Brit. Zool. ii. 491.—Phal. platyrhinchus, *Temm.* Orn. ii. 712.—A rare winter visitant.

Length $7\frac{6}{10}$, breadth $16\frac{2}{10}$ inches; weight $1\frac{3}{4}$ ounce. Bill brown, yellowish towards the base; feet greenish-grey; irides reddish-yellow. A yellow band above the eyes. Wing-covers black, with white tips. A white band across the wings. Rump white, with black spots. *Female* larger, the front, nape and crown sooty black, the eye-band pure white.—Nest unknown. *Young* with a black horse-shoe mark on the nape; the plumage, above, cinereous-brown with yellow margins; beneath white. In winter, the old birds resemble in plumage the young.—This bird seems to breed in the Arctic Regions. Captain Sabine states, that a flock of them was seen swimming among icebergs on the 10th June, on the west coast of Greenland, in Lat. 68°,—*Linn. Trans.* xii. 536.; and he afterwards states, that they are abundant during the summer months on the North Georgian Islands,—*Parry's 1st Voyage*, App. cci.

Gen. LXIV. LOBIPES. Cootfoot.—Bill slender, straight, depressed at the base, subulate at the tip.

134. L. *hyperboreus*. Red Coot-foot.—Crown, nape, over the eye and sides of the breast deep ash-grey; sides and front of the neck reddish-brown.

Larus fidipes, *Will.* Orn. 270.—Tringa hyp. *Linn.* Syst. i. 249.—Red Phalarope, *Penn.* Brit. Zool. ii. 492.—Phalaropus Williamsi, *Simmonds*, Lin. Trans. viii. 264.—Phalaropus hyp. *Sowerby*, Brit. Mis. Tab. x. *Temm.* Orn. ii. 709.—Breeds in Orkney.

Length 8, breadth 14 inches. Bill black, slightly deflected at the extremity. Feet greenish-grey. Irides brown. Plumage, above, black, bordered with ferruginous. A white band across the wings and the two middle tail-feathers. Beneath white, with cinereous spots on the flanks. *Female* has the reddish colour mixed with cinereous.—Nest of grass, on the margin of lakes. Eggs olive, with crowded black spots. The *young* have the plumage, above, brownish-black, the feathers on the back with a reddish margin; beneath greyish-white, with a tinge of yellow on the neck. The old birds in winter are said to resemble the young. This species breeds in several small lakes in Orkney, where it is called *Water-Snipe.* It is rare in other districts, and usually appears only as a winter visitant.

GEN. LXV. RECURVIROSTRA. AVOSET.—Bill recurved; connecting membrane of the toes reaching nearly to the extremity.

135. R. *Avocetta.* Scooping Avoset.—Crown, hind neck, back and quills black; rest of the plumage white.

Will. Orn. 240. *Linn.* Syst. i. 256. *Penn.* Brit. Zool. ii. 504. *Temm.* Orn. ii. 590.—*E*, Butterflip, Scooper, Yelper, Picarini, Crooked-belly, Cobler's-awl; *W*, Pig mynawd.—Resident in England, a straggler in Scotland.

Length 18, breadth 30 inches; weight 13 ounces. Bill black, slender, flexible. Legs bluish-grey. Irides reddish-brown. Outer scapulars and middle covers of the wings black; ridge of the wings and greater covers white. *Female* similar.—Nest in a small hole on the drier parts of extensive marshes. Eggs 2, olive-grey, with black spots. In the *young*, the black has a brownish tinge, and the scapular feathers have a reddish border.—After the breeding-season, this bird retires from the fens, and assembles in flocks of six or seven, frequenting the sea-shore during the winter season.

GEN. LXVI. NUMENIUS. CURLEW.—Face feathered. Nasal groove extending three-fourths of the length of the bill. Nostrils linear. Hind toe touching the earth. The first quill longest.

136. N. *arquata.* Common Curlew.—Plumage greyish-white, with brown streaks: scapulars black, with brown margins.

Will. Orn. 216. *Sibb.* Scot. 18.—Scolopax arq. *Linn.* Syst. i. 242. *Penn.* Brit. Zool. ii. 429.—Num. arq. *Temm.* Orn. ii. 603.—*S*, Whaap, Stock Whaap; *W*, Gylfinhir.—Common. .

Length 24, breadth 42 inches; weight 37 ounces. Bill black, 6 or 7 inches long. Legs lead-coloured. Breast, belly and rump white, with oblong dusky spots and bars. Tail of 12 feathers, grey, with brown bands. *Female* with more grey and legs brown.—Nest in unfrequented heaths and marshes, of dried stalks. Eggs 5, olive, with brown spots. *Young* leave the nest upon being hatched: have the bill short, and the plumage like the female.—The curlew soon leaves the breeding-ground, and, during the winter season, frequents the sea-shore, and damp grounds in the neighbourhood.

137. N. *Pheopus.* Whimbrel Curlew.—Plumage greyish-white, with brown streaks; scapulars brown, with pale edges; longitudinal brown band on each side of the crown.

Arquata minor, *Will.* Orn.—Scol. Pheop. *Linn.* Syst. i. 243. *Penn.* Brit.

Zool. ii. 430.—N. Pheop. *Temm.* Orn. ii. 604.—*E*, Curlew Knot, Curlew Jack, Half Curlew ; *W*, Coeg ylfinhir.—Breeds in Zetland.

Length 18, breadth 33 inches; weight 14 ounces. Bill 3½ inches long, dusky, tinged with red at the base: feet greyish. In general aspect and plumage bearing a near resemblance to the Curlew. *Female* like the male.—Nest in exposed heaths in Zetland (where the bird is called Tang-whaap). Eggs 4 or 5. After the breeding-season, this bird nearly disappears from the northern islands, but frequents, during winter, the English shores, associating in small flocks.

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STRAGGLERS.

Ibis falcinellus. Glossy Ibis.—*Temm.* Orn. ii. 596.—This bird, readily distinguished from the Curlews by the naked face, has occurred, as a straggler, repeatedly, in England. Montagu, in his Supplement, records several instances, and states it as his opinion, in which he is followed by Temminck, that the Bay Ibis (*Tantalus Falcinellus*, Sowerby's Brit. Misc. tab. xvii.), the Glossy Ibis (*T. igneus*, including *T. guarauna)*, and the Green Ibis (*T. viridis)*, are merely different states of plumage, depending on age, of the same species,—the Green Ibis being the young bird. " The Ibis is adopted as part of the arms of the Town of Liverpool, and formerly, if not at present, stood conspicuous on the Guildhall in truly golden array. This is termed the *Liver*, from which that flourishing town derived its name, and is now standing on the spot where the *Pool* was, on the verge of which the Liver was killed."—*Montagu.*

GEN. LXVII. TOTANUS.—Bill soft at the base, firm, with cutting edges towards the point. Upper mandible a little inflected over the under. Legs long, slender. The first quill longest.

138. T. *fuscus.*—Base of the lowest mandible and feet red ; rump white ; tail-covers with cross black and white rays.

Cambridge Godwit, *Penn.* Brit. Zool. ii. 446.—Spotted Snipe, *Mont.* Orn. Dict. and Suppl.—Totanus fuscus, *Temm.* Orn. ii. 639.—On the coast during winter.

Length 12, breadth 22 inches; weight 5 ounces. Bill upwards of 2 inches in length, black, the base of the lower mandible and the feet red. Face and plumage above, dusky; back, wing-covers and scapulars with white spots; beneath, dusky tinged with grey, the tips of the feathers white. In winter, the plumage, above, has a greyish tinge; below, white: lores dusky.—*Young* birds have the plumage with a tinge of olive-brown; scapulars and wing-covers with triangular black spots: belly whitish, with zig-zag lines and spots of brownish-ash.

139. T. *calidris.* Redshank.—Base of both mandibles red ; distal half of the secondaries white.

Gallina erythropus, *Will.* Orn. 221. *Sibb.* Scot. 19.—Scolopax calidris, *Linn.* Syst. i. 245. *Penn.* Brit. Zool. ii. 446.—Tot. cal. *Temm.* Orn. ii. 643.—Resident.

Length 12, breadth 21 inches; weight 5 ounces. Bill 2 inches long, black at the point, the base, together with the feet, red. Irides chesnut. Lores white. Above, greyish olive-brown, with longitudinal black rays; on the scapulars there are a few transverse black rays. Rump white. Sides of the neck and beneath white, with a longitudinal black spot on the centre of each feather.

Quills 26, the first five dusky, the remainder increasing in whiteness from the tip. Tail feathers 12, rayed with black and white. The first and second toes webbed to the first joint, the second and third slightly webbed.—In the winter dress, the plumage, above, is cinereous-brown, with dusky spots; throat and breast greyish-white, with fine brown streaks; belly pure white.—Nest of coarse grass, upon hillocks in boggy places. Eggs 4, olive-brown, spotted with black. The *young* have the plumage, above, brown, with yellow margins. Breast cinereous, with narrow brown streaks. Tips of the tail-feathers reddish. Base of the bill yellowish. The Redshank leaves the marshes after the breeding-season, and leads a solitary life on the sea-shore during winter. —The difference in plumage between this species and the Red-legged Sandpiper of Bewick (Brit. Birds, ii. 113.), which Montagu terms *T. Bewickii*, is so very inconsiderable, as to lead to the conclusion that they are identical.

140. T. *ochropus.* Green Sandpiper.—All the tail feathers white one-third from the base; the two or three exterior ones entirely white, or with only a spot near the end.

Tringa Aldrovandi, *Will.* Orn. 222.—Tr. ochropus *Linn.* Syst. i. 250. *Penn.* Brit. Zool. ii. 468.—Tringa glareola, *Markwick*, *Linn. Trans.* i. 128. and ii. 325.—Tot. och. *Temm.* Orn. ii. 651.—In England from August to April, frequenting pools and streams.

Length 10 inches; weight 3½ ounces. Bill an inch and a half long, dusky, tinged with green at the base. Legs dusky green; the outer and middle toes united at the base by a membrane. Lores with a brown and white band. Irides hazel. Quills 24, dusky: the under wing-covers dusky, with white V-like markings. Upper tail-covers, and beneath, white; the neck and breast with fine brown spots. Tail of 12 feathers, even at the tip, white, with the two middle feathers crossed with 3 or 4 black bands which diminish in number towards the lateral feathers. In winter, the plumage is paler, and the spots on the breast less distinct.—Nest in the sand or grass on the margin of lakes or streams. Eggs 3–5, greenish, with brown spots. The *young* have yellow dots on the back, the nape cinereous, the breast more spotted, and the black on the tail more extended. Is not known to breed in this country.

141. T. *Glareola.* Wood Sandpiper.—Tail, to the base, barred with brown and white.

Mont. Orn. Dict. and Suppl.—Tot. glar. *Temm.* Orn. ii. 654.—A winter visitant of England.

Length 9 inches; weight 2¼ ounces. Bill 1¼ inches long, black, greenish at the base. Legs greenish, slender, 3 inches long from the knee to the tip of the middle toe, and the base of feathers one inch above the knee; the outer toe connected at the base by a membrane. Irides dusky. Lores dusky, above white. Plumage above, brown, with whitish streaks. Throat, belly, and both tail-covers, white. Breast white, with longitudinal streaks of deep brown. Quills black, slightly tipped with white, except the first three or four: shaft of the first quill white; under covers destitute of the V-like marks. Tail cuneiform, of 12 feathers. The two or three outer feathers have the inner web white. In winter, the plumage is less distinctly marked. —Nest in marshes. Eggs 4, yellowish, with brown spots? *Young*, with the plumage above having numerous red dots; breast waved with grey, and spotted with brown.—The several instances of the occurrence of this bird recorded by Montagu, in his Supplement, indicate it as a winter visitant.

142. T. *macularia.* Spotted Sandpiper.—Plumage, below, marked with large rounded spots; the two middle tail-feathers plain.

Spotted Sandpiper, *Penn.* Brit. Zool. ii. 463. *Bewick*, Brit. Birds, ii. 111. Tot. mac. *Temm.* Orn. ii. 656.—A rare winter visitant. Probably only a straggler.

Length 8 inches. Bill black, reddish towards the base. Feet flesh-coloured. Irides brown. Lores brown, with a white stripe above. Plumage, above, greyish-brown, with a tinge of olive, with streaks of black on the head and neck, and triangular black spots on the back in zig-zag bars. Below white, the ends of each feather having a rounded black spot: these marks are produced on the belly. Quills dusky, the secondaries tipped with white. Rump plain. Tail-feathers, in the middle, greenish-brown, the side ones white, with dusky bars and dark tips.—So rare is this bird in England, that Edwards and Bewick only have succeeded in procuring it. Its history is still involved in much obscurity.

143. T. *Hypoleucos.* Common Sandpiper.—Plumage, beneath, uniformly white; the four middle tail-feathers plain.

Tringa minor, *Will.* Orn. 223.—Tr. Hyp. *Linn.* Syst. i. 250. *Penn.* Brit. Zool. ii. 470.—Tot. Hyp. *Temm.* Orn. ii. 657.—*W*, Pibydd y tracth; *S*, Killileepie.—Breeds on the margin of streams. Common.

Length 8, breadth 16 inches; weight 2 ounces. Bill 1¼ inches long, dusky. Legs dusky with a tinge of green; toes flat below, slightly margined, webbed at the base of the first joint. Irides hazel. Plumage, above, brown, glossed with olive, with a black streak in the middle of each feather; the wing-covers with minute undulated lines. A white spot above the eyes. Neck with brown streaks. Quills dusky; the first plain; the second and nine following with a white spot on the inner web; the rest with a white band across both webs. Tail fan-shaped, the four middle feathers like the back, slightly clouded; the four on each side tipped with white, and spotted on the webs.—Nest of dry leaves, under a bank. Eggs 5, dirty white, marked with numerous dusky and cinereous spots, chiefly at the larger end. *Young* with the margin of the feathers on the back reddish.—This species, as a summer visitant, is extensively distributed on the margins of rivers and lakes during summer. It breed as far to the northward as Caithness, but seems to be wanting in Orkney.

144. T. *Glottis.* Greenshank.—Bill strong, slightly recurved, compressed at the base, higher than broad; under wing-covers with brown rays; feet green.

Pluvialis major, *Will.* Orn. 220.—Scolopax glottis, *Linn.* Syst. i. 245. *Penn.* Brit. Zool. ii. 445.—Tot. Glot. *Temm.* Orn. ii. 659.—A winter visitant.

Length 14, breadth 24 inches; weight 6 oz. Bill 2½ inches long, dusky; legs slender, green. Irides hazel. Plumage, above, brownish-black, on the head marked with black and white rays; a white circle round the eyes; back and scapulars deep black, the former with white edges, the latter with white spots. Beneath white, with oval spots on the breast. Wing-covers reddish-ash, with black stripes. Quills 26, dusky, inner webs spotted with white. Under covers with brown rays. Tail white, the two middle feathers cinereous, with brownish bands. Lower part of the back and rump white. In winter, the spots on the breast are indistinct, and the back has a brownish tinge.—Nest unknown.—Frequents the sea-coast in small flocks.

Montagu (Suppl. Orn. Dict.) has offered a conjecture, which appears very probable, that the *Cinereous Godwit* of Pennant (Brit. Zool. ii. 444.), the *Scolopax canescens* of Gmelin, is merely a variety of the Greenshank. Pennant says, " The bill was two inches and a half long. The head, neck, and back variegated with ash colour and white: the tail slightly barred with cinereous. The throat and breast white; the last marked with a few ash-coloured spots. The legs long, slender, and ash-coloured. This was about the size of my

Greenshank: approaches it nearly in colours; but the bill was so much thicker, as to form a specific distinction." Montagu adds (Suppl. Orn. Dict.), "One of these birds in the late unfortunate Leverian Museum was marked *Grey Godwit.* It appeared to be rather smaller than the Common Godwit, the bill and legs rather shorter, and more slender; the tail barred dusky and white nearly to the base: the rump white, with a few spots: the back and scapulars pale brown, with grey borders."

It is not improbable that the Black Sandpiper of Pennant (ii. 264.) is merely the Greenshank in its winter dress.

GEN. LXVIII. SCOLOPAX.

SNIPE.—Bill straight, soft, and swollen near the end, and in drying becomes like shagrin. Tip of the upper mandible enlarged beneath for the reception of the extremity of the lower.

a. *Tibia feathered even to the knee.* WOODCOCKS.

145. S. ***Rusticola.*** Woodcock.—Crown cinereous; nape with transverse black bars.

Will. Orn. 213. *Sibb.* Scot. 18. *Linn.* Syst. i. 243. *Penn.* Brit. Zool. ii. 433. *Temm.* Orn. ii. 673.—*W*, Cyffylog; *G*, Coilleach coille.—A regular winter visitant.

Length 14, breadth 26 inches; 12 ounces. Bill 3 inches long, livid, dark at the tip. Legs livid. Irides hazel. Lores black. Plumage, above, variegated with red, yellow, cinereous and black. Beneath, yellowish-white, with cross-waved brown bars. Quills 23, black, with transverse reddish bars. Tail of 12 feathers, black, tipped with grey above and white below. *Female* larger, with white spots on the wing-covers.—Nest on the earth. Eggs 4, yellowish, spotted with brown.—This species visits us about the first week of October, arriving at night with a north-east wind; and departs in March. A few, however, have been known to breed in this country.

b. *Lower part of the tibia naked.* SNIPES.

146. *S. major.* Great Snipe.—Tail of 16 feathers; shaft of the first quill white.

Penn. Brit. Zool. ii. 450. *Temm.* Orn. ii. 675.—Rare in Britain.

Length 12 inches; weight 8 ounces. Bill 2¾ inches long, brown, the base reddish. Feet greenish-grey. Crown black, divided by a band of yellowish-white, similar to one over the eyes. Above, variegated brown and red; the latter colour disposed longitudinally. Beneath, reddish-white; the belly and sides with black bands. This species seems of rare occurrence. The following remark by Mr Bewick, however, would lead us to believe that it is probably overlooked, and by sportsmen not distinguished as a species. "The author has seen three specimens of a large kind of snipe, called by some sportsmen, from being always found alone, *The Solitary Snipe.* They weighed the same as the above mentioned (8 oz.), but differed in some slight particulars, measuring only 12 inches in length, and from tip to tip about 19. The upper parts of the plumage were nearly like those of the common snipe. The breast, sides, belly, and vent, white, spotted, barred, and undulated with black. It is not clearly ascertained whether this be a distinct species of snipe, or whether it acquires its bulk, and change of plumage, from age, and its solitary habits from ceasing to breed."—*Brit. Birds*, ii. p. 67.

147. *S. Sabini.*—Tail feathers 12. Plumage destitute of longitudinal bands.

N. A. Vigors, Esq. Linn. Trans. xiv. 557.—Rare.

Length $9\frac{3}{10}$ inches. Bill $2\frac{7}{10}$ inches, brownish-black; the upper mandible inclining to chesnut at the base. Tarsi $1\frac{1}{4}$ inches. The plumage generally is brownish-black; the margin of the feathers chesnut, darkest on the back. Tail-feathers black at the base, with ferruginous bands towards the tip. The absence of white and the stripes of ferruginous yellow, so common to the other species, serves to distinguish this new addition to the European Fauna. Two specimens only have as yet occurred; the one shot in Queen's County, Ireland, by the Reverend Charles Doyne, of Portarlington, 21st August 1822, and now in Mr Vigors's valuable collection at Chelsea; the other on the banks of the Medway, near Rochester, 26th October 1824, and preserved in the collection of Mr Dunning of Maidstone.—*Linn. Trans.* ib.

148. *S. Gallinago.* Common Snipe.—The tail of 14 feathers. A dark divided stripe on the crown.

Gallinago minor, *Will.* Orn. 214. *Sibb.* Scot. 18.—Scol. Gal. *Linn.* Syst. i. 244. *Penn.* Brit. Zool. ii. 448. *Temm.* Orn. ii. 676.—*W*, Yonittan, y Fyniar; *G*, Croman loin.—Common near marshes.

Length 12, breadth 14 inches; weight 4 ounces. Bill upwards of 3 inches in length, black, yellow, changing into brown towards the base. Tail dusky, with a tinge of green. Irides dusky. Lores brownish-black. The crown similar, but divided in the middle, and separated on each side from the lores by stripes of yellowish-red. Neck yellowish-red, with dusky streaks. Back black, the feathers bordered with yellowish-red, most conspicuous on the scapulars. Chin and belly white. Quills 24, dusky; under covers white, with black bars. In winter the red on the plumage is paler, approaching to white.—Nest of coarse grass on a dry spot in a marsh. Eggs 5, greenish, with brown and grey spots.—Occasionally shifts its station after the breeding season.

149. *S. Gallinula.* Jack Snipe.—Tail feathers 12. A dark undivided stripe on the crown.

Gallinago minor, *Will.* Orn. 214.—Scol. Gal. *Linn.* Syst i. 244. *Penn.* Brit. Zool. ii. 451. *Temm.* Orn. ii. 678.—Not uncommon in winter.

Length $8\frac{1}{2}$ inches; weight 2 ounces. Bill an inch and a half long, like the preceding. Legs pale greenish-dusky. Irides dusky. Lores dusky; between which and the crown stripe is a pale yellowish-brown one, divided over the eye. Cheeks yellowish-white; the ear-covers dusky. Back black, with a strong purple gloss, edged with yellowish-red. Four stripes of yellowish-red on the back, formed in consequence of one web being of a uniform light colour. Belly white. Quills dusky. Tail dusky, freckled near the end, with reddish-brown and white. This species is not known to breed in this country.—Its visits are in winter. It differs from the preceding, in being a more solitary bird, and more difficult to rouse from its haunts.

STRAGGLER.

1. *S. grisea.* Brown Snipe.—*Temm.* Orn. ii. 679.—Grey Snipe.—This species has the first and second toes united the length of the first joint, by a web. The tail-feathers are 12 in number, with black and white bands. The crown, neck, breast, and wing-covers, plain cinereous-brown.—This species, a native of North America, has twice occurred in Europe; once in Sweden, and once in England. Montagu, in his *Orn. Dict.*, records the latter instance. It was shot in the beginning of October, on the coast of Devonshire. It was poor, single, very tame, suffering the person who killed it to approach very near. He has added, in the *Supplement*, a figure of the individual.

GEN. LXIX. LIMOSA. GODWIT.—Bill long, recurved, compressed at the base, becoming depressed towards its blunt tip. Outer toe connected by a web, at the base, with the middle one.

150. *L. ægocephala.* Black-tailed Godwit.—Tail black, with a white base; the middle feathers shortest. A white spot on the wing. Claw of the middle toe long and serrated.

Fedoa secunda, *Will.* Orn. 216.—Scolopax Limosa ægocephala, *Linn.* Syst. i. 145,–6.—Red Godwit, *Penn.* Brit. Zool. ii. 442.—Red Godwit and Jadreka Snipe, *Mont.* Orn. Dict. Suppt.—Limosa melanura, *Temm.* Orn. ii. 665.—A rare winter visitant.

Length 18 inches; weight 12 ounces. Bill 3½ inches long, dusky at the point, orange at the base. Legs black. Irides hazel. Lores brown, above which is a whitish-red stripe. The crown black; the feathers bordered with red. Throat and neck red, with brown dots. Breast and sides red, with fine zig-zag bars. Back black, the feathers on the scapulars with red bands. Wing-covers grey. Belly white. Base of the quills and tail, white.—In the winter, the plumage above is cinereous; below white, with a greyish tinge on the neck.—Nest in meadows. Eggs 4, deep olive, with pale spots. The *young* have the feathers on the crown brown, with red margins. The outer edge of the tail-feathers white, and the tip of the bill brown.—This species, though common both in its Polar and Equatorial migrations in Holland, can scarcely be termed a regular visitant of this country. It frequents marshes, seldom approaching the sea-shore.

151. *L. rufa.* Bar-tailed Godwit.—All the tail-feathers with black and white bands. The middle feathers longest. Claw of the middle toe short and plain.

Fedoa Gesneri, *Will.* Orn. 215.—Scolopax Lapponica, *Linn.* Syst. i. 246. —Godwit, *Penn.* Brit. Zool. ii.—Common Godwit, Red-breasted Snipe, *Mont.* Orn. Dict.—Limosa rufa, *Temm.* Orn. ii. 668.—*E*, Godwit, Stone Plover, Yarwhelp, Yarwhip; *S*, Poor Willie; *W*, Rhostog.—A regular winter visitant.

Length 17½, breadth 28½ inches; weight 12½ ounces. Bill 4 inches long, black at the tip, livid at the base. Feet black. Irides brown. Crown red, with brown streaks. Back black, with oval marginal red spots. The wing-covers grey, with white borders. Rump white, with brown spots. Quills black, mottled with white on the inner webs. Beneath deep red, with black streaks on the sides of the breast. The *female* is larger; the plumage, above, inclines more to brown, mixed with grey; and beneath it has a tinge of yellow. In winter, the plumage above is cinereous, with brown streaks; and beneath, white.—This species occurs in small flocks, from autumn to spring, frequenting the sea-shore. It is not known to breed in Britain.

GEN. LXX. TRINGA. SANDPIPER.—Bill straight, or a little deflected; compressed at the base; depressed at the point.

152. *T. subarquata.*—Bill deflected, much longer than the head. The two middle tail-feathers longest. Tarsus 17 lines in length.

Pigmy Curlew, and Pigmy Sandpiper, *Mont.* Orn. Dict. and Suppt.—T. sub., *Temm.* Orn. ii. 607.—In England rare.

Length 8½, breadth 15½ inches; weight 2 ounces. Bill 1½ inches long, obviously bent, black. Legs black, bare of feathers for half an inch above the knee. Irides brown, the face, over the eyes and the throat white, with brown dots. Crown black, the edges of the feathers red; nape red, with black streaks. Back black, the edges of the feathers with angular red spots. Beneath reddish-brown, more or less marked with dark spots and white. Quills with pale margins on the inner web. Tail cuneiform, dusky grey, bordered with white; upper and under-covers white, with black and red bars. In winter, the plumage above is cinereous-brown, with dark streaks; below white. The tail is cinereous, bordered with white. The outer feathers white on the inside. In the *female*, the bill is longer.—Nest near water. Eggs 5, yellow, with broad spots. The *young* nearly resemble the winter dress of the old birds. This species, which is not uncommon on the Continent, and which breeds in Holland, might be considered as a straggler here, were it not probable that it is confounded with the following species.

153. *T. alpina.* Dunlin.—Bill a little longer than the head. Two middle tail-feathers produced, pointed. Tarsus 12 lines in length.

Alauda marina (the Stint and Dunlin), *Will.* Orn. 226.—*Sibb.* Scot. 19.—T. alp. and Cinclus, *Linn.* Syst. i. 249. and 251.—Dunlin, Purre, and Brown Sandpiper, *Penn.* Brit. Zool. ii. 471,–2.—T. variabilis, *Temm.* Orn. ii. 612.—*E*, Least Snipe, Ox-Bird, Ox-Eye, Bull's Eye, Sea-Lark, Wagtail; *S*, Pickerel, Sea-Snipe.—Common.

Length 8, breadth 14 inches; weight 10 drams. Bill 1¼ inches in length; black, slightly deflected. Palate with reflected teeth. Feet dusky. Irides dark-brown. Plumage above black; the edges of the feathers rufous and cinereous: beneath white, slightly streaked on the neck with dusky; the breast and upper belly black, the feathers with white margins. Quills dusky, the first the longest, and reaching to the end of the tail; the basal half of the secondaries, and their tips, white; the tips of the first covers white; the tertials produced. Tail of 12 feathers, dusky, margined with white; the two middle ones darkest, produced, and pointed; the lateral tail-covers are white, the central ones black and long. In this its summer or breeding dress, it is the *Dunlin* of British writers. In winter, the plumage, above, is more or less cinereous, with dusky streaks: below, the black on the breast has faded into dusky streaks, in which dress it is the Purre *.—Nest in heaths, of dried rushes. Eggs 4, smoky white, irregularly marked with light and dark brown blotches. *Young*, with the lores, dusky; the neck and breast cinereous, with dusky streaks.—This species is solitary during the breeding-season, but collects in flocks, and is common on the shore during the remainder of the year.

154. T. *pusilla.*—Tail cuneiform, the external feathers white.

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* It is of importance to attend to the character of these changes of plumage at the different seasons of the year. A feather which, in summer, is of a dark colour, with a light margin, may, in winter, become wholly white. This takes place by the light colour of the margin extending with the fading of the dark colour of the middle, a trace of which is generally left at the shaft, near the base. In summer this process is again reversed. It was formerly considered by British ornithologists, and is still regarded in the same light, by the celebrated Temminck, that these changes in the colour of the plumage are effected by *moulting*. Many years ago, I demonstrated the fallacy of this opinion; and my conclusions have been subsequently confirmed by several acute and practical ornithologists.—See my *Philosophy of Zoology*, v. ii. chap. 2.

Linn. Syst. i. 252.—Little Sandpiper, *Mont.* Orn. Dict. App.—T. Temminckii, *Tem.* Orn. ii. 622.—A rare winter visitant.

Length 6 inches; weight 6 drams. Bill ¾ths of an inch long, slender, slightly deflected towards the extremity, and, with the feet, brown. Irides dusky. Plumage, above, black with red margins; below, cinereous red with black streaks, the throat, belly, and under tail-covers, white. Quills dusky, margined with white. Tail of twelve feathers, the two middle dusky, the next on each side cinereous, with reddish margins; the two or three exterior feathers pure white. In winter the plumage above is brownish, with darker streaks. The young are more inclined to cinereous above.—This species, which is well described by Montagu, from a specimen shot in November on a salt-marsh, near the sea in Devonshire, has probably been confounded with the preceding. The character of the tail identifies it with the Linnean species, and renders unnecessary the new trivial name which Leister proposed, and which Temminck has too hastily adopted.

155. T. *minuta.*—Tail doubly forked, the lateral feathers greyish brown, with white margins.

Little Sandpiper, *Penn.* Brit. Zool. ii. 473.—Little Stint, *Bewick's* Brit. Birds, ii. 122.—Little Sandpiper, *Mont.* Orn. Dict. Supp. *Temm.* Orn. ii. 624.—A rare winter visitant.

Size the same as the preceding, with this difference, that M. Temminck assigns 8 lines as the length of the tarsus of the *pusilla*, and 10 to the *minuta.* Bill and legs black. The crown black, with red spots. Plumage, above, black with red margins; below, the sides of the neck and breast are red, with angular brown spots; the middle of the breast, throat, belly and lateral upper tail-covers white. The rump and two middle tail-feathers black, the lateral ones greyish-brown with white margins. In winter the plumage above is cinereous, with brownish-black streaks at the shafts; the two middle tail-feathers brown. The young nearly resemble the winter garb of the old birds. The margins of the scapulars and wing-covers incline more to white. An examination of the descriptions of the British writers, quoted above, seems to point out, very obviously, their connection with this species of Temminck, to which they are here referred. They all agree nearly in size, and in the colour of the rump and tail; characters which mark the distinction between this species and the *pusilla.* In all, however, the form of the tail is not mentioned, which is said to be doubly forked, or to have the middle and external feathers of the same length, the intermediate ones on each side shorter.

156. T. *Canutus.* Knot.—Bill straight, much enlarged at the end; the tail-feathers of equal length, cinereous with a white margin.

Knot, *Will.* Orn. 224.—T. Can. (Calidris and Islandica), *Linn.* Syst. ii. 251–2. and App.—Red Sandpiper (T. Islandica), Ash-coloured Sandpiper (T. cinerea), Aberdeen Sandpiper, and Knot, *Penn.* Brit. Zool. ii. 469, 462, and 461.—T. cinerea, *Temm.* Orn. ii. 627.—A winter visitant.

Length 10, breadth 19 inches; weight 5 oz. Bill 1¼ inches in length, greenish black; the feet of the same colour. The hind toe, according to Captain Sabine (App. Parry's 1st Voy. cci.) turns inwards, as in that of the turnstone. Irides brown. Plumage, above, black, bordered with red, with oval spots of the same colour on the scapulars; below brownish red, the belly white, with red and black spots. Quills dusky, edged with white. Tail-feathers dusky ash, edged with white; the upper covers white, with black bars and red spots. Willoughby states, that the outer tail-feathers are white. In winter the plumage above is cinereous, with brown streaks, and below white, with dusky streaks on the breasts and sides. In the young there is more cinereous above and white below than in the old birds. The Knot, named after King Canute, who prized it for the table, formerly visited the fens of Lincolnshire in autumn, and was caught and fattened with the ruff. According to Montagu, (Supp. Orn. Dict.), it does not now visit its former haunts, nor is it known to breed in England. It probably breeds in Orkney, as I have shot one in Sanda on the 15th June (1808).

157. T. *striata* (Brisson). Purple Sandpiper.—Base of the bill and legs yellow, the two middle tail-feathers black.

Linn. Syst. i. 248. *Fab.* Faun. Gröen. 107.—T. maritima (Brunich), *Markwick*, Linn. Trans. W. 22.—T. nigricans, *Mont.* ib. p. 40.—T. marit. *Temm.* Orn. ii. 619.—A winter visitant.

Length 8½, breadth 15½ inches; weight 2 ounces. Bill 1¼ long, red at the base, black at the tip. Legs yellow. Irides dusky. Plumage, above, black with a violet gloss, each feather margined with white; neck and breast greyish-white, with lanceolate, dusky spots; middle of the belly white. Quills black, the shafts and edges of the exterior webs white. Rump and two middle tail-feathers black, the rest cinereous with white margins. In winter, the plumage above becomes dull, with a feebler gloss of purple, and the edges of the feathers have a grey margin. In the *young*, the feathers above are black, with white changing into red margins; and the edges of the wing-covers have much white.—This is not uncommon on the sea-shore during winter.

158. T. *pugnax*. Ruff.—Tail rounded, the two middle feathers barred, the three lateral ones plain.

Avis pugnax, *Will.* Orn. 224.—T. pugnax, *Linn.* Syst. i. 247.—Ruff, Gambet (T. gambetta), *Penn.* Brit. Zool. ii. 457-465.—Ruff, Gambet, Greenwich Sandpiper, Equestrian Sandpiper, and Yellow-legged Sandpiper, *Mont.* Orn. Dict. App. and Supp. t. p. *Temm.* Orn. ii. 631.—*E*, (males) Ruffs, (females) Reeves.—A summer visitant.

Length 1, breadth 2 feet; weight 7 ounces. Bill yellow, sometimes black at the tip. Feet yellow. Irides brown. Face naked, covered with yellow warts. A spreading tuft of feathers on each side of the neck. The wing-covers are brown, inclining to ash colour. The middle tail-feathers are barred with black and brown; the lateral ones are cinereous-brown. The lateral and under covers white. The rest of the plumage subject to vary. The *female* is smaller and destitute of a ruff, of a pale brown, the back spotted with black, and edged with white.—Nest in a tuft of grass in the fens. Eggs 4, white, marked with rusty spots. *Young* like the female. In winter the face is covered with short feathers, and the ruff of the male disappears. He is very pugnaceous, and even in confinement fights readily with a rival. Ruffs are taken by nets, the males especially, and fattened for the table with bread and milk, and boiled wheat. They are chiefly found in the breeding season on the fens of Lincolnshire.—This species forms the genus MACHETES of Cuvier.

GEN. LXXI. STREPSILAS. TURNSTONE.—Bill strong, conical, depressed, and pointed. Wings acuminated; the first quill longest. The front toes united at the base.

159. S. *interpres*. Common Turnstone.—Bill and irides black, feet orange.

Morinellus marinus, *Will.* Orn. 231.—Tringa interpres et Morinellus, *Linn.* Syst. i. 248.—*Penn.* Brit. Zool. ii. 465. No. 199. and 200.—Strepsilas collaris, *Temm.* Orn. ii. 553.—*E*, Sea dotterel; *S*, Skirlcrake; *W*, Huttan y mor.—A winter visitant of England and Scotland; stationary in Zetland.

Length 9½ inches; weight 4 ounces. Bill an inch in length, bends a little upwards. Legs short, a little way naked above the knee; claws black. The hind toe "turns inwards, instead of taking, as is usual, a straight direction backwards," (Captain Sabine, Parry's 1st Voy. App. cc.) Frontal band, behind the ear, lower part of the neck behind, and lower part of the back, throat, and belly, white; breast black, the colour extending round the neck up to the ears, and thence to the bill across the forehead. Crown reddish-white, with black streaks. Back ferruginous, with black spots. A brown band on the rump. Quills dusky, shafts of the primaries, tips of the secondaries, and edges of the greater covers, white. Tail of 12 feathers, black tipped with white, sometimes the two middle feathers are wholly black, and the outer one on each side white. In the *female* the colour is less bright.—Nest a shallow pit in the sand on the shore. Eggs 4, olivaceous, with brown spots. In the *young*, the white about the head has dusky streaks; the back is dusky, the feathers with reddish margins; breast dusky, with white edges. From having seen this species at all seasons in Zetland, I conclude that it breeds there. Captain Sabine states that it breeds in the North Georgian Islands.—During winter it frequents the sea-shore, turning over the small stones in search of insects.

GEN. LXXII. VANELLUS. LAPWING.—Nasal groove extending two-thirds of the length of the bill. Hind toe distinct. The fourth and fifth quills longest.

160. V. *cristatus*. Common Lapwing.—The feathers of the hind head produced, subrecurved, forming a crest.

Capella sive Vanellus, *Will.* Orn. 228. *Sibb.* Scot. 19.—Tringa vanellus, *Linn.* Syst. i. 248. *Penn.* Brit. Zool. ii. 458.—Van. crest. *Temm.* Orn. ii. 558.—*E*, Bastard Plover, Pewit; *S*, Peesweep; *W*, Cornchwegl; *G*, Curcag, abhararcan-luachrach.—Resident.

Length 13½, breadth 31 inches; weight 8 ounces. Bill 1 inch long, black. Irides hazel. Legs dull orange. The crown, crest and breast, black, iridescent; back green, iridescent; sides of the neck, belly, and base of the tail, white. Quills black, with a white spot on the tips of the first four; secondaries white half way from their base. Tail white, the end black; the vent and upper cover ferruginous. *Female* with the colours more obscure, and the crest shorter.—Nest, consisting of a few dried stalks, placed in a shallow cavity in moist grounds. Eggs 4, olive-brown, blotched with black. I have found them to weigh in grains 435, 426, 413, 400. The *young* have the crest very short, and the feathers both above and below edged with yellow.—After the breeding season the lapwing occurs in flocks, and frequents the sea-shore, and occasionally, during mild weather, turnip fields.

GEN. LXXIII. SQUATAROLA.—Nasal groove short. Hind toe minute. The first quill longest.

161. S. *cinerea*.—Bill, legs, and irides black; middle tail-feathers with black and white rays.

Pluvialis cinerea, *Will.* Orn. 229. *Sibb.* Scot. 19.—Tringa Squatarola et Helvetica, *Linn.* Syst. ii. 250-252. *Penn.* Brit. Zool. ii. 458.—Vanellus melanogaster, *Temm.* Orn. ii. 547.—*E*, Grey Plover.—A winter visitant of England, probably breeds in Scotland.

Length 12, breadth 24 inches; weight 7 ounces. Bill 1¼ inch long. Lores, throat, sides and front of the neck, middle of the breast and belly, black; the front, below the eyes, sides of the breast and thighs, white; nape varied with brown, black, and white. Back black, with white spots. Quills black, the inner webs more or less white, and the same colour prevailing from the fifth on the outer webs. The long feathers at the base of the wing, underneath, black. Under and upper tail-covers white, with oblique black bands. In winter the plumage beneath is white, with cinereous brown spots on the neck and sides; above a brownish-black prevails, with yellowish spots, and edged with ash-grey. *Female* like the male.—Eggs 4, olive, with black spots. *Young* spotted below, above tinged with grey; the bands on the tail are grey.—This species frequents the sea-shore during the winter season in small flocks. I have reason to believe that it breeds in the high grounds of the Mearns.

* * *

Before proceeding to give the characters of the few native birds of that division of Pressirostres with only three toes, it is proper to notice two stragglers.

1. *Cursorius Isabellinus.* Cream coloured Courser.—*Temm.* Orn. ii. 513.—This species is a native of Africa, rarely visiting Europe. Three instances only have occurred of its having been killed in England. The first at St Albans, in Kent, at the seat of William Hammond, Esq. who presented it to Dr Latham. The second was shot in North Wales in 1793, by Mr George Kingston of Queen's College, Oxford. The third is stated in Atkinson's Compendium of British Ornithology, p. 165, as having been shot near Wetherby in April 1816.

2. *Himantopus Plinii.* Long-legs.—*Will.* Orn. 219.—Charadrius Himantopus, *Linn.* Syst. 1. 255.—Himantopus melanopterus, *Temm.* Orn. ii. 528.—Sir Robert Sibbald appears to have first recorded the occurrence of this bird in these islands, Scot. Ill. 18. tab. xiii. fig 2., an individual having been examined by him which was shot at a lake near the town of Dumfries; where a second example was shortly afterwards killed. Mr White states, that six individuals of this species were observed at Frinsham Pond, near Farnham, Surrey, (Nat. Hist. Selborne, ii. 42.) Pennant states, that one was shot at Stanton Harcourt Common, near Oxford, (Brit. Zool. ii. 476.) The last occurred to Mr Davies of Aber, killed in Anglesea, (Nat. Miscellany, tab. 195. *Mont.* Orn. Dict. Supp.) The species frequents Africa, Asia, and eastern Europe.

GEN. LXXIV. CALIDRIS. SANDERLING.—Bill depressed, and enlarged at the point. Nasal grooves produced.

162. C. *arenaria.* Common Sanderling.—The two middle tail-feathers, bill, irides, and feet, black.

> Arenaria, *Will.* Orn. 225.—Tringa ar. *Linn.* Syst. i. 251.—Sanderling Plover, *Penn.* Brit. Zool. 480.—Cal. ar. *Temm.* Orn. ii. 524.—*E*, Curwillet, Towwilly, Waddergall; *W*, Llwyd y tywod.—Common on the coast.

Length 8, breadth 15 inches; weight 2 ounces. Bill about an inch in length, weak and flexible. Face and crown with black spots, edged with red and white. Neck and breast cinereous red, spotted with black. Above, the plumage is black, with white edges; wing-covers dusky, with zig-zag lines of red; belly white. Quills dusky, the secondaries white towards the base. The tail-feathers becoming more cinereous from the two dark middle ones. In winter the plumage below is white, and above cinereous, with dusky streaks. *Female* like the male.—Nest unknown. The *young* have the dusky plumage of the back, with yellowish borders, and spots of the same colour; and the breast with waved dusky lines.—This species occurs in small flocks during winter. It probably breeds with us, as Mr Simmonds observed it in the Mull of Cantyre on the 2d June (Linn. Trans. viii. 268), and Mr Bullock in the end of June, in "the most northern part of Scotland."—*Mont.* Orn. Dict. Suppt.

GEN. LXXV. CHARADRIUS. PLOVER.—Bill shorter than the head, upper mandible swollen dorsally near the end.

163. C. *Pluvialis.* Green Plover.—Bill and legs dusky, plumage, above, black, with yellowish green spots.

Pluvialis viridis, *Will.* Orn. 229. *Sibb.* Scot. 19.—Char. Pluv. *Linn.* Syst. i. 254.—Golden Plover, *Penn.* Brit. Zool. ii. 474.—Char. Pluv. *Temm.* Orn. ii. 535.—*E*, Grey Plover, Whistling Plover; *W*, Cwttyn yr aur. —Common on heaths in summer, and the sea-shore in winter.

Length 11, breadth 24 inches; weight 9 ounces. Bill one inch. Irides hazel. Front, and a space above the eyes, white; neck white, with dusky and yellow spots; belly white. Breast black. Quills dusky, with white margins. Tail of 12 feathers. In winter the black on the back fades to dusky, and the black on the breast disappears. The *female* has the black on the breast less distinct.—Nest, of a few rushes, in heaths. Eggs 4, cinereous-olive, blotched with dusky.—In the *young* the yellow is less bright, and the whole plumage has a cinereous tinge.

164. C. *Morinellus.* Dottrel.—Bill and legs dusky; breast dull orange, passing, above, into a transverse line of white, surmounted by a narrow one of black.

Morinellus Anglorum, *Will.* Orn. 230. *Sibb.* Scot. 19.—Char. Mor. *Linn.* Syst. i. 254. *Penn.* Brit. Zool. ii. 477. *Temm.* Orn. ii. 537.—*W*, Huttan; *G*, Amadan mointich.—A summer visitant.

Length 10, breadth 19 inches; weight 5 ounces. Bill an inch in length. Irides hazel. Feet with a greenish tinge. Cheeks, throat, and a broad stripe from above the eyes to the nape, white; crown and belly black. Back olive-brown, with ferruginous margins. Vent and thighs rufous. Quills dusky-brown; the shaft of the first white. Tail of 12 feathers; brown, barred near the end with black, and tipped with white. In winter the plumage, above, has a cinereous tinge. The *female* has likewise more cinereous, and the black on the belly is mixed with white.—Nest unknown.—The *young* have the crown reddish, with longitudinal dark streaks.—This species appears in England and the south of Scotland in April, and again in September. On the Grampians, however, there is reason to believe that it breeds. In the Statistical Account of the Parish of Carmylie (vol. i. 437), it is said, "The dottrels, birds of passage, alight on the rising grounds, about the beginning of April, continue here about three weeks, remove to the Grampian hills about 12 miles to the northward, and revisit this parish about the beginning of August. After abiding here about three weeks, they fly off to the southward, and are not seen till the first of April following." Colonel Thornton informed Montagu that he saw dottrels in pairs on the Grampians; but not young birds.

165. C. *Hiaticula.* Ringed Plover.—Bill and legs orange; breast with a large black patch encircling the neck.

Will. Orn. 230. *Sibb.* Scot. 19. *Linn.* Syst. 253. *Penn.* Brit. Zool. ii. 479. *Temm.* Orn. i. 539.—*E*, Ring Dottrel, Sea Lark, Dulwilly; *S*, Sandy Laverock, *N*, Sandy Loo.—Resident.

Length 7½, breadth 16 inches; weight 2 ounces. Bill half an inch long, with the point black. Claws black. Irides hazel. Front and cheeks black, the former divided by a white band between the eyes. Above light brownish-ash; the greater covers tipped with white. Throat, extending round the neck, and belly, white. Quills dusky, a part of the shafts and webs at the base white. Tail of 12 feathers, the exterior ones longest; the two middle ones brown, dusky towards the tips; the three next black towards the end; the next with only a brown band on the inner web; the outer one white. Plumage less bright in winter, particularly the black patch on the breast. In the *female* the white on the front is less, that on the wings greater, and the plumage is more cinereous.—Nest in a cavity in the sand near high-water mark. Eggs 4, cinereous-brown, with black and grey spots. —The *young* have the black dusky, and they are destitute of the white frontal band. The bill is dusky, and the feet are yellowish-brown.—This species frequents all our shores; feigns lameness to lead intruders from its nest; and becomes gregarious during the winter.

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As a straggler only must we here record the *Kentish Plover* of Latham, the C. Alexandrinus, *Linn.* Syst. i. 253.—Ch. Cantianus, *Temm.* Orn. ii. 544.—It differs from the ringed plover in size, being a little less; in the bill and feet being black; the front above the eye, a band on the nape, and below, being white; lores, triangular patch on the head, and one on each side the breast, black. The head is ferruginous; the two outer tail-feathers white. Dr Latham received one from Mr Boys of Sandwich 23d May 1787, and two others in April 1791. Though Temminck describes this bird, unhesitatingly, as a distinct species, it should be mentioned, that Montagu (in Lin. Trans. vii. 281., and Orn. Dict. Suppt.) is somewhat confident that the Alexandrine and Kentish Plovers of Latham and Lewin are only the stages of the ringed plover towards maturity;—an opinion which the circumstances of the case render probable.

GEN. LXXVI. OIDICNEMUS. THICK-KNEE.—Bill longer than the head. Both mandibles swollen at the extremity.

166. O. *Bellonii*. Common Thick-knee.—Base of the bill, margin of the eye-lids, irides, and legs, yellow.

Will. Orn. 227.—Charadrius Oidicnemus, *Linn.* Syst. i. 255.—Thick-kneed Bustard, *Penn.* Brit. Zool. i. 287.—Oid. crepitans, *Temm.* Orn. ii. 521.—*E*, Stone Curlew, Norfolk Plover.—Summer visitant of the eastern counties of England.

Length 18, breadth 36 inches; weight 18 oz. Bill about two inches long, the tip black. Behind the eye there is a small space bare of feathers, of a yellowish green, mostly concealed by the ear covers. Plumage, above, reddish-brown, with black streaks. Above and beneath the eye a pale stroke. Breast, belly, and a band across the wings, white. Quills black, the two first with a broad bar of white across each web. Tail of 12 feathers, short, a dark band crosses the middle of each, the tips are black, the rest white. *Female* similar.—Nest in fields, on the bare ground.—Eggs 2, dirty white, with dark bloody blotches. —*Young* run immediately after being hatched, and skulk among stones. (*White's* Selb. i. 76.)—Arrives in March, departs in October. Occasionally remains during the winter.

GEN. LXXVII. HÆMATOPUS. OYSTER-CATCHER.—Bill much longer than the head, straight, compressed. Toes flat below. The first quill longest.

167. H. *Ostralegus.* Common Oyster-catcher.—Bill, irides, and margin of the eye-lids, scarlet.

H. Bellonii, *Will.* Orn. 220. *Sibb.* Scot. 19.—H. ost. *Linn.* Syst. i. 257. *Penn.* Brit. Zool. ii. 482. *Temm.* Orn. ii. 531.—*E*, Sea Pie, Tirma, Trillechan; *N*, Chalder, Skeldrake.—Common on the sea-shore.

Length 17, breadth 32 inches; weight 16 ounces. Bill 3 inches long; legs reddish; claws hooked, hollow and black. Head, neck, upper part of the back, scapulars, and upper wing-covers, black; lower part of the back, rump, greater wing-covers, and belly, white. Quills black, with white on the inner webs. Tail black at the tip, white at the base. In winter there is a white crescent on the throat, and a white spot under the eye. *Female* like the male.—Nest, of a few lichens, on rocks or gravel. Eggs 2, olive-brown, blotched with black.—In the *young* the black is dusky; the feathers with brownish margins. —Feeds on shell-fish, which it detaches and penetrates with its stout bill. Though usually considered as a shore bird, I have observed it breeding on the islands in the Tummel at Moulincarn, between Dunkeld and Blair Athol.

GEN. LXXVIII. OTIS. BUSTARD.—Bill about the length of the head, incurvated. Nostrils exposed. The third quill the longest.

168. O. *Tarda.* Great Bustard.—Bill compressed at the base. Head and neck ash-coloured.

Will. Orn. 129. *Sibb.* Scot. 16. *Linn.* Syst. i. 264. *Penn.* Brit. Zool. i. 284. *Temm.* Orn. ii. 506.—Resident in Norfolk.

Length 4, breadth 9 feet; weight 25 pounds. Bill greyish-white; legs black, irides reddish-brown. A tuft of long feathers on each side of the lower mandible. Above, yellowish-red, with black rays: beneath, white. Quills black, tipped with white. Tail of 20 feathers, ferruginous, barred with black; the outer ones nearly white. Furnished with a gular pouch for holding water. *Female* less; destitute of the long moustaches and gular pouch.—Nest on the bare ground.—Eggs 2, olive-brown, blotched with rusty and grey spots. *Young* buff-coloured, barred with black above.—Feeds on green corn, the tops of turnips, and clover. Greatly reduced in its geographical distribution, by having been long persecuted by the sportsman. In England it is now almost confined to Norfolk. In Scotland it seems to have been found in the days of Boece: Sibbald, however, seems to view it as rare in his day; and it is now reduced to the rank of a straggler. One was shot in 1803, in Murrayshire by William Young, Esq. of Boroughhead.

STRAGGLER.

O. *Tetrax.* Little Bustard.—*Temm.* Orn. ii. 507.—This species, which is only about 16 inches in length, has occurred in England five or six times, as noticed in the works of Montagu, Bewick, and Selby. It is chiefly a native of southern and eastern Europe.

PALMIPIDES.

WATER BIRDS.

- I. Hind toe united with the front toes by a continuous membrane. Nasal openings indistinct.
  - Phalacrocorax.
  - Sula.
- II. Hind toe separate.
  - *a.* Margin of the mandibles with corneous teeth; the sides of the tongue with tufts of pectinated bristles.
    - *b.* Bill broad. Teeth in the form of transverse plates.
      - *c.* Trachea of the male with a capsular enlargement at the bronchial extremity.
        - *d.* Hind toe bordered with a membrane.
          - *e.* Base of the bill enlarged.
            - Oidemia.
            - Somateria.
          - *ee.* Base of the bill plain.
            - Clangula.
            - Nyroca.
        - *dd.* Hind toe not bordered by a membrane.
          - *e.* Bill wide at the extremity.
            - Tadorna.
            - Spathulea.
          - *ee.* Bill nearly of equal breadth throughout.
            - Anas.
      - *cc.* Trachea of the male simple at the bronchial extremity.
        - Cygnus.
        - Anser.
    - *bb.* Bill narrow; margins with reflected teeth; the upper mandible hooked at the end.
      - Mergus.
  - *aa.* Margin of the bill and tongue destitute of teeth or bristles.
    - *b.* Wings short. BRACHYPTERÆ.
      - *c.* Bill compressed and obliquely furrowed. Tridactyle.
        - Alca.
        - Fratercula.
      - *cc.* Bill conical, subcompressed, and destitute of furrows.
        - *d.* Webs scalloped. A hind toe with a broad web.
          - Podiceps.
        - *dd.* Web entire.
          - *e.* Tridactyle.
            - Colymbus.
          - *ee.* Tetradactyle.
            - *f.* Upper mandible notched at the point.
              - Uria.
            - *ff.* Upper mandible plain.
              - Cephus.
              - Mergulus.

bb. Wings long, and well adapted for flight. MACROPTERÆ.
- *c.* Nostrils prominent, tubular.
  - Procellaria.
  - Puffinus.
- *cc.* Nostrils plain.
  - *d.* Bill hooked at the end.
    - Cataractes.
    - Larus.
  - *dd.* Bill pointed.
    - Sterna.

GEN. LXXIX. PHALACROCORAX. CORMORANT.—Bill compressed, the margin entire, the extremity hooked. Tail rounded. Middle claw serrated.

169. P. *Carbo.* Common Cormorant.—Tail of fourteen feathers. Length of the bill, from the tip to the feathers on the front, 2 inches and 3 lines. *(Temminck.)*

Corvus aquaticus, *Will.* Orn. 248.—*Sibb.* Scot. 20.—Pelecanus Carbo, *Linn.* Syst. 1. 216. *Penn.* Brit. Zool. ii. 608.—Carbo cormoranus, *Temm.* Orn. ii. 894.—*E*, Cole-Goose; *S*, Great Scarf or Scart; *W*, Mulfran; *N*, Brongie, Lorn.—Common.

Length 3, breadth 4 feet; weight 6 or 7 pounds. Bill 5 inches long, dusky; the bare space at the base yellow. Feet and legs black. Irides green. Plumage black, with green and purple reflections; gorget white; and numerous, slender, white feathers on the head, neck, and thighs. A crest of long feathers on the hind head. Quills and tail black. In winter the crest is wanting, the gorget is dirty white, the feathers on the back have a cinereous brownish tinge, and the peculiar slender white feathers drop off. Nest on rocks, on the shore, or even on trees near large lakes. Eggs 3 or 4, greenish-white, with a rough crust. Young with more brown than even the winter garb, the bill and irides are brown, and there is no crest.—In an example taken alive in April, and kept in confinement, by Montagu, the plumage changed from the summer to the winter dress, and continued in that state. The white gorget, the white on the neck and thighs, and the crest disappeared.—This species frequently visits fresh water lakes and rivers, and readily perches on trees.

170. P. *Graculus.* Common Shag.—Tail long, conical, of 12 feathers, Length of the bill, from the tip to the feathers on the front, 1 inch and 10 lines. *(Temm.)*

Corvus aquaticus minor, *Will.* Orn. 249. *Sibb.* Scot. 20.—Pel. Grac. *Linn.* Syst. 1. 217. *Penn.* Brit. Zool. li. 610.—Carbo Grac. *Temm.* Orn. ii. 897.—*E*, Shag, Crane; *S*, Scart; *W*, Y Fulfran leiaf.—Common.

Length 28, breadth 42 inches; weight 4 pounds. Bill dusky, towards the base including the naked skin, yellowish. Irides reddish brown. Legs black. Plumage glossy greenish-black. Small white feathers scattered over the neck and thighs. Nape with a crest of long green feathers. In winter, the white feathers disappear, and the plumage, above, becomes more cinereous. Nest on rocks, of a few sea-weeds. Eggs 2, with a rough crust. *Young* cinereous on the throat, and the plumage on the back is more or less cinereous-brown. This species seldom leaves the sea-shore.

171. P. *cristatus*. Crested Shag.—Tail short, rounded, of 12 feathers. Length, from the tip of the bill to the feathers on the front, 2 inches 4 lines. *(Temm.)*

Pel. crist. *Fab.* Faun. Grœn. 90.—Carbo crist. *Temm.* Orn. ii. 900.—Confounded with the preceding.

Size like *P. graculus*, or larger. Bill brown. Irides green. Feet black. Plumage deep green, with a tinge of bronze on the back and wings; each feather with a black margin. Crown with a tuft of feathers, upwards of an inch long, and capable of erection. Nape with a crest of 10 or 12 long subulate feathers. Wings reach to the base of the tail. Tail very short, rounded. Plumage destitute of the peculiar, slender, white feathers possessed by the two-preceding species. In winter the coronal tuft disappears. Nest and eggs like the shag. The *young* may readily be distinguished by their long slender bill and short tail. Above, the plumage is greenish-brown; beneath, cinereous-brown, with more or less white. The circumstance of each having only 12 tail-feathers, has caused the Common and Crested Shags to be confounded. The one noticed by Montagu in the Supp. Orn. Dict., as having been killed by Mr Bullock on the Bass, belongs to the latter species. The preceding characters, chiefly extracted from Temminck, will serve to point out the distinction.

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In the proceedings of the Linnean Society, " Annals of Philosophy," vol. xxii. p. 152, it is stated, that, on 3d June 1823, there was read " a letter from Mr Robert Anstice, relative to a bird shot in the neighbourhood of Bridgewater, varying but little from the crested cormorant, and distinguished by having 16 feathers in the tail." No notice is taken of this circumstance in the " Extracts from the Minute-book."—*Linn. Trans.* xiv. p. 582.

GEN. LXXX. SULA. GANNET.—Margin of the bill serrated, extremity nearly straight. No occipital osseous appendage, as in the preceding genus.

172. S. *Bassana*. Common Gannet.—Plumage white, the crown buff colour.

Anser Bassanus, *Will.* Orn. 247. *Sibb.* Scot. 20.—Pel. Bass. *Linn.* Syst. i. 217. *Penn.* Brit. Zool. ii. 612.—S. alba, *Temm.* Orn. ii. 905.—*E*, Gannet; *S*, Solan Goose, Solan (Norse Sule); *W*, Gan.—Common.

Length 3, breadth 6 feet; weight 7 pounds. Bill (together with the naked spot) bluish, 6 inches long, nearly straight, a little bent at the point, where there is a slight nail. Irides yellow. Legs and toes black, with green streaks, nails white. Bastard wing and greater quills black. Tail of 12 pointed feathers, the middle ones longest.—Nest of sea-weeds, on small inaccessible islands. Eggs 1, white, rough.—*Young*, during the first year, with the plumage brownish-black, the irides brown. The second year each feather above has a white spot at the end; below, a dusky spot on each side of the shaft. Gannets breed in great numbers on the Bass, Souleskerry, St Kilda, Ailsa, and Skelig Islands. They betake themselves to the open sea during the winter, pursuing the shoals of herrings, pilchards, and other fish. They dart nearly vertically upon their prey in the water.

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The Great White Pelican (*Pelecanus onocretulus*, *Temm.* Orn. ii. 891.), a native of eastern Europe, was shot in England, at Horsey Fen, in 1663, as appears from a MS. of T. Brown of Norwich, in the British Museum. Dr

Leith is said to have seen a pelican, of a brown colour, fly over his head in the month of May at Blackheath in Kent, supposed to be the *P. fuscus*, an American species.—*Mont.* Supp. Orn. Dict.

GEN. LXXXI. OIDEMIA. SCOTER.—Bill tumid at the base above.

173. O. *fusca.* Velvet Scoter.—Plumage black, with a white wing spot.

Anas niger Aldrov. *Will.* Orn. 278.—A. fusca, *Linn.* Syst. i. 196. *Penn.* Brit. Zool. ii. 583. *Temm.* Orn. ii. 855. (Trachea, Lin. Trans. iv. tab. xv. f. 3–7.)—*E*, Velvet Duck, Double Scoter, Great Black Duck; *W*, Hwyad felfedog.—A regular winter visitant of the coast.

Size of the domesticated drake. Bill yellow, the swellings at the base and margins black, the nail red. Irides and legs red, claws and webs black. Below the eye a white crescent. *Female* with the plumage, above, dusky; below, whitish. Tumour at the base of the bill less. Breeds, according to Temminck, in the Arctic Regions, but it is not mentioned by Fabricius or Sabine.

174. O. *nigra.* Black Scoter.—Plumage entirely black.

A. niger, *Will.* Orn. 180.—A. nigra, *Linn.* Syst. 1. 196. *Penn.* Brit. Zool. ii. 584. *Temm.* Orn. ii. 853.—*E*, Scoter, Black Diver; *W*, Y for Hwyad ddu.—A winter visitant of the coast.

Length 22, breadth 34 inches; weight 3 pounds. Bill black, orange in the middle. Irides brown, eyelids yellow. Legs and feet dusky, the webs black. Tail of 16 pointed feathers, cuneiform. *Female* inclining to dusky, the knob at the base indistinct. Breeding place unknown.

175. O. *leucocephala.* White-throated Duck.—Bill blue. Front, cheeks, and throat, white.

Will. Orn. An. 367. (*Mont.* Orn. Dict. Supp.) *Penn.* Brit. Zool. ii. tab. xcviii.—Anas leuc. *Temm.* Orn. ii. 859.—Rare.

Size of the preceding. Bill with the middle at the base hollowed. Irides yellow. Feet greyish-brown. Crown, nape and lower parts of the neck, black; the front, cheeks, and throat, white. Breast, upper parts and sides dark red, waved with dusky. Rump reddish-purple. Tail long, black, conical, with the feathers grooved. Plumage, below, reddish-white. *Female*, with the crown and nape brown: throat yellowish-white: bill and legs reddish.—This species seems to be confounded with the preceding. The description of the female Scoter, by Montagu, has a reference to this species.

* * *

As a straggler may be noticed the *O. perspicillata* (A. per. *Temm.* Orn. ii. 853.) It agrees with *O. nigra* in wanting the wing spot, and in having the plumage black, but the nape and a frontal band are white. The bill is yellow, with a black mark on each side, having in front a space of grey. It is said by Temminck to have occurred in Orkney.

GEN. LXXXII. SOMATERIA. EIDER.—Base of the bill extending up the forehead, and divided by a triangular projection of feathers.

176. S. *mollissima.* Common Eider.—Lateral divisions of the bill flattened; bill and legs dusky green.

Eider, *Will.* Orn. 277. *Sibb.* Scot. 21.—A. moll. *Linn.* Syst. i. 198. *Penn.* Brit. Zool. ii. 581. *Temm.* Orn. ii. 848.—*E*, Edder, Cuthbert Duck; *S*, Dunter Goose; *W*, Hwyad fwythblu.—In the islands of Scotland, common.

Length 22 inches, weight 4 pounds. Bill 2½ inches long. Irides brown. Crown (with the exception of a white line near the nape), front and sides of the head, black. Nape to the throat pea-green. Cheeks, chin, back, and breast, white; the latter with a reddish tinge. Quills and tail brown. The belly and rump black. *Female* less; plumage reddish-brown, with transverse waved black lines.—Nest of sea-weeds, lined with the *down*, so well known, which it plucks from its body. Eggs 5, pale greenish-olive.—The *young* male cinereous, with brown spots; breast with transverse black and white rays. The trachea resembles that of the King Eider.

177. S. *spectabilis*. King Eider.—Lateral divisions of the bill elevated, arched, ridged; bill and feet vermillion.

Anas spect. *Linn.* Syst. i. 195. *Temm.* Orn. ii. 851. (Trachea, Linn. Trans. xii. tab. xxx. f. 1, 2.) Breeds in the Northern Isles.

In size nearly equal to the last. Feathers at the base of the bill, black; crown and nape bluish-grey; cheeks green; neck, back, and sides of the rump, white; scapulars, lower part of the back, wings, tail, and belly black. Tertials as in the preceding species, deflected. *Female*, like that of the preceding species in plumage, but the base of the bill furnishes sufficiently distinguishing marks.—Nest of sea-weeds, lined with down. Eggs 6, cinereous-olive.—Mr Bullock found this species breeding in Papa Westra, Orkney, in the end of June.—*Mont.* Supp. Orn. Dict.

Gen. LXXXIII. CLANGULA.—Bill short and narrow.

178. C. *vulgaris*. Golden Eye.—Bill black, legs yellow. A white spot under the eye. Wing-spot white.

Anas platyrynchos mas, *Will.* Orn. 282.—A. Clangula, *Linn.* Syst. i. 201. *Penn.* Brit. Zool. ii. 587. *Temm.* Orn. ii. 870. (Trachea, Linn. Trans. iv. tab. xv. f. 1, 2.).—*E*, Pied Wigeon; *S*, Gowdy Duck; *W*, Llygad aur.—A regular winter visitant of the coast and lakes.

Length 19, breadth 31 inches; weight 2 pounds. Bill broader at the base than the point; the nostrils small, placed beyond the middle. Irides bright yellow. Webs of the toes dusky. Head and upper neck green, with a tinge of purple. Lower neck, beneath, part of the scapulars, and greater wing-covers, white. Back, rump, and lesser wing-covers, black. Quills black, except seven of the secondaries, which are mostly white. Tail dusky, of 16 pointed feathers. In the *female*, the bill is yellowish at the point, the head is brown, the feathers on the back dusky, edged with cinereous. Breeds in the northern regions, in lakes and ponds (Phil. Trans. lxii. 417.). *Young* like the *female*. In the second year the white eye-spot appears. The young and female have been described by several British writers as the Morillon (*A. Glaucion*, Linn.). The windpipe and tail readily furnish proofs of identity.

179. C. *histrionica*. Harlequin Duck.—Bill and legs black. A white patch before the eye. Wing-spot blue.

A. hist. *Linn.* Syst. i. 204. *Sowerby's* Brit. Misc. tab. vi. *Temm.* Orn. ii. 878.—A rare winter visitant of the north of Scotland.

Length 17, breadth 26 inches; weight 18 ounces. Bill, with the nostrils near the base, above. Irides brown. Legs with a bluish tinge. Head, neck, back, wings, and rump, black, with purple reflections. In front of the eyes, on the ear, a stripe on the sides of the neck, ring round the lower part of the neck (which is edged with black), crescent on the breast, and a few of the scapulars, white. Breast blue. Belly brown, reddish on the sides. The stripe above the eye reddish. Tail brown. *Female* less, plumage, above, brown; beneath, including the breast, white; cheeks, throat, and round the lower part of the neck, white, with a rufous tinge. In this state it is the *Anas minuta*, Linn. Syst. i. 204. A pair, male and female, were sent from Scotland to Mr Sowerby by Lord Seaforth; and Mr Simmons gave him a young female, which he shot in one of the Orkney Islands.

180. C. *glacialis*. Long-tailed Duck.—Bill black, crossed with orange. Legs red. A black spot on the ear. Wing-spot brown. Middle tail-feathers produced.

A. caudacuta Islandica, *Will.* Orn. 290.—A. glac. (et hyemalis), *Linn.* Syst. i. 203. *Penn.* Brit. Zool. ii. 599. *Temm.* Orn. ii. 860.—(Trachea *Mont.* Orn. Dict. Supp. iii, iv., and Linn. Trans. xii. tab. xxx. f. 3, 4.) —*S*, Coal-and-Candle-light; *N*, Calloo.—A winter visitant.—Rare in England.

Length 22, breadth 29 inches; weight 24 ounces. Irides orange. Claws black. Crown and back of the neck black. Neck, scapulars, and belly white; the sides of the neck, cheeks, and front, brown, with a tinge of grey; breast, wing-covers, and back, deep chesnut, inclining to black. Primaries dusky; secondaries brown. Tail, with the four middle feathers black, the rest white: the two middle feathers produced 3 inches beyond the others.—In winter the crown is white. *Female* destitute of the long tail-feathers; the front and cheeks are bluish-white, breast variegated with grey and brown; feathers on the back bordered with greyish-red. Breeds in the Arctic Regions. *Young* like the female.—It resides in Zetland from October to April, in small flocks, feeding in shallow water near the shore.

GEN. LXXXIV. NYROCA.—Bill broad and depressed.

181. N. *leucophthalmos*. White Eye.—Bill and legs blue. Irides white. Wing-spot white and black.

Anas fera fusca minor, *Will.* Orn. 281.—Ferruginous Duck, *Penn.* Brit. Zool. ii. 591.—A. nyroca, *Sower.* Brit. Misc. tab. xxi.—A. Africana, *Bullock*, Linn. Trans. ix. 178.—A. leuc. *Temm.* Orn. ii. 876.—(Trachea, *Mont.* Orn. Dict. Supp. i. 11.)—A winter visitant of England.

Length and breadth 17 inches; weight 33 ounces. Bill long, with a black nail; webs black. Head, neck, breast, and sides, ferruginous, with a collar of a darker colour. A white spot on the chin. Back and wings black, with purple gloss, and small red spots. Belly and under tail-covers white. Vent brown. Quills dusky, the secondaries white, with black ends. Tail of 14 brown feathers. In the *female* the head is brown, and the back dusky. This species frequents rivers and lakes.

182. N. *ferina*. Pochard.—Bill black, with a blue band in the middle; legs blue. Irides orange. No wing-spot.

Anas fera fusca, *Will.* Orn. 288.—A. ferina, *Linn.* Syst. i. 203.—*Penn.* Brit. Zool. ii. 600. *Temm.* Orn. ii. 868.—(Trachea, Linn. Trans. iv. tab. xiv. f. 5, 6.).—*E*, Poker, Red-headed Wigeon, Blue Poker, Duncur; *W*, Hwyad bengoch.—A winter visitant of the sea-coast.

Length 19, breadth 30 inches; weight 28 ounces. Head and neck glossy chesnut; upper part of the back, round to the breast, rump, and under tail-covers, black; scapulars, wing-covers, and belly, greyish-white and variegated.

Quills dusky. Tail of 14 feathers, dusky. *Female*, with the head, neck, and breast brown, mixed with white round the eyes and throat. *Young* like the female. The black colour on the breast of the young males does not make its appearance during the first year.

183. N. *Marila*. Scaup. Bill blue; legs grey. Irides yellow. Wing-spot white.

The Scaup Duck, *Will.* Orn. 279.—Anas marila, *Linn.* Syst. i. 196.—*Penn.* Brit. Zool. ii. 586. *Temm.* Orn. ii. 856.—(Trachea, Linn. Trans. iv. tab. xiv. f. 3, 4.)—*E*, Spoonbill Duck; *W*, Llygad arian.—A winter visitant of the sea-coast and lakes.

Length 17 inches; weight 25 ounces. Head, neck, upper part of the back, rump, vent, and breast black, the two former with a green gloss; back, wing-covers, and sides, white, variegated with black. Belly white. Quills dusky, the secondaries white, tipped with black, tail pointed, of 16 feathers. *Female*, having the black replaced by brown, with a broad white band round the base of the bill. In this state it is the *Anas frænata* of Sparman, and the White-faced Duck of Sowerby, Brit. Misc. lxii. The young males resemble the female, and have a few white feathers at the base of the bill. The young females have little white or grey on the back.

184. N. *Fuligula*. Tufted Duck.—Bill and legs blue. Irides yellow. Wing-spot white.

Anas Fuligula, *Will.* Orn. 280. *Linn.* Syst. i. 207. *Penn.* Brit. Zool. ii. 585. *Temm.* Orn. ii. 873.—A winter visitant of our sea-coasts and lakes.

Length 17 inches; weight 25 ounces. Nail of the bill black. Head, with a pendent crest. The head, neck, and upper parts of the body, black, with a green and violet gloss, the back with specks of grey; belly white; thighs and vent black. Quills dusky, the middle of the secondaries white. Tail cuneiform, of 14 feathers. *Female* with the plumage less distinctly marked. The *young* want the crest, and have the front white.—In England its visits are regular; but in Orkney and Zetland it only appears after severe, stormy weather.

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As a domesticated species, the *Carina moschata*, *Anas mos.* Linn. Syst. i. 199. (Trachea, Linn. Trans. iv. tab. xiv. f. 1, 2. tab. xvi. f. 5, 6.), or Musk Duck, here merits a place. It is a native of tropical countries, yet it thrives in Britain, lays many eggs, and its flesh is good. The drakes, however, are fierce, and often injure the other poultry. The musky smell is connected with the feathers only, and has given rise to the name.

GEN. LXXXV. TADORNA. SHELDRAKE.—Bill broad at the end, hollow in the middle, and raised into a tubercle at the base.

185. T. *Vulpanser*. Common Sheldrake.—Bill and legs red; nail of the bill and nostrils black.

T. Bellonii, Vulpanser quibusdam, *Will.* Orn. 278.—Skeeling-goose, *Sibb.* Scot. 21.—Anas Tadorna, *Linn.* Syst. i, 195.—*Penn.* Brit. Zool. ii. 589. *Temm.* ii. 833.—(Trachea, Linn. Trans. iv. tab. xv. f. 8, 9.)—*E*, Burrow Duck, Bargander, Pirennet; *S*, Stockannet, Sly-goose.

Length 2, breadth 3½ feet; weight 2¾ pounds. Head and neck dark glossy green. Lower part of the neck next to the breast, back, rump, and sides of the belly white. Breast, along the middle of the belly, and upper part of the back, red. Outer half of the scapulars and quills black, the secondaries glossed with green. Tail of 14 white feathers, tipped with black. *Female*, with the tubercle at the base of the bill less, and the colours of the plumage more obscure.—Nest in old rabbit-holes near the shore. Eggs 12 to 16, of a white colour.—*Young* have the head and neck whitish, and the bill and legs flesh coloured.—Easily tamed, but is seldom fertile in a confined state.

GEN. LXXXVI. SPATHULEA. SHOVELER.—Bill depressed, much enlarged in breadth at the extremity; the teeth long, and lock into each other when the mouth is closed.

186. S. *clypeata*. Common Shoveler.—Bill black; legs red; wing-spot deep green.

A. platyrhynchos, *Will.* Orn. 283.—A. clypeata, *Linn.* Syst. i. 200. *Penn.* Brit. Zool. ii. 596. *Temm.* Orn. ii. 842.—(Trachea, Linn. Trans. iv. tab. xiii. f. 4, 5.)—*E*, Blue-winged Shoveler; *W*, Hwyad lydanbig.—A winter visitant.

Length 21 inches; weight 22 ounces. Bill 3 inches in the gape, rounded at the margin, with a small incurved nail. Irides yellow. Head and neck glossy green; breast and scapulars white. Back, sides, and belly brown, the latter paler; vent black. Wing-covers blue. Quills brown, the secondaries green on the outer webs. Tail of 14 dusky feathers, edged with white; the outer ones wholly white; the rump, and upper and under tail-covers, glossy green. *Female*, with the margin of the bill at the base orange; plumage in general mottled rufous brown, and black.—Nest on the margins of lakes. Eggs 12, clear greenish yellow.—*Young* like the female. In the intermediate plumage the young males have been characterised as a species under the name of the "Red-breasted Shoveler." The Shoveler frequents fresh water lakes. A few pairs probably remain to breed with us: Indeed, Mr Youell has found their nest and eggs, Linn. Trans. xiii. 6, 15.

GEN. LXXXVII. ANAS. DUCK.—Bill plain above the nostrils, and depressed.

187. A. *Boschas*. Common Duck.—Bill green; legs orange. Wing-spot purple. Four middle tail-feathers recurved.

Boschas major, *Will.* Orn. 284. *Sibb.* Scot. 21.—A. Bos. *Linn.* Syst. i. 205. *Penn.* Brit. Zool. ii. 591. *Temm.* Orn. ii. 85.—(Trachea, Linn. Trans. iv. tab. xiii. f. 10.)—*E*, Mallard; *S*, Stock Duck, Mire Duck; *W*, Cors Hwyad, Garan Hwyad, Hydnwy; *G*, Lacha chinn uaine.—Common near marshes.

Length 23, breadth 35 inches; weight 40 ounces. The bill has a yellowish tinge. Irides brown. Head and neck a rich green, ending in a white collar; breast and upper back brown. Back variegated with white and brown; belly similar, but lighter. Wing-covers with a white band, edged with black. Secondaries fine purple, ending in black, with white tips. Rump and both covers of the tail black. Tail of 20 pointed feathers, the four recurved ones glossy greenish-black, the rest greyish-brown, margined with white. *Female* brown, with dusky spots and lines; throat white, the middle tail-feathers not recurved.—Nest of dry grass, lined with its own feathers and down. Eggs 10 to 18, bluish-white.—*Young* males like the female.—This species has suffered much from the operations of agriculture, many of its haunts and breeding places having been drained. It is the stock from which the domestic duck has sprung.

188. A. *strepera*. Gadwall.—Bill black; feet orange. Wing-spot white.

A. platyrhynchos rostro nigro, *Will.* Orn. 287.—A. strep. *Linn.* Syst. i. 200. *Penn.* Brit. Zool. ii. 603. *Temm.* Orn. ii. 837.—(Trachea, Linn. Trans. iv. tab. xiii. f. 7, 8.)—*E*, Gray, Rodge.—A rare winter visitant.

Length 19, breadth 33 inches. Bill 2 inches long. Irides brown. Head and neck grey, with brown spots; breast and back rayed with black and white lines. Lesser wing-covers chesnut; greater covers, rump, and both covers of the tail, black. Belly white. Greater quills dusky; three of the secondaries with the inner web white. Tail short, of 16 pointed feathers, grey, with a tinge of red, and pointed with white. *Female* reddish-brown, spotted with black, the rump and tail-covers grey.—This species is so rare in England (though common in other countries of Europe in the same latitude), that Montagu was never able to procure a recent species for examination.

189. A. *acuta*. Cracker.—Bill blue, feet dusky. Wing-spot purple. The two middle tail-feathers produced.

A. caudacuta, *Will.* Orn. 289.—A. acuta, *Linn.* Syst. i. 202. *Penn.* Brit. Zool. ii. 598. *Temm.* Orn. ii. 839.—(Trachea, Linn. Trans. iv. tab. xiii. f. 6.).—*S*, Sea Pheasant, Pintail, Winter Duck.—*W*, Hwyad gynffonfain.—Frequently taken in decoys on the English coast.—Rare in Scotland.

Length 28, breadth 38 inches; weight 24 ounces. Bill inclining to black in the middle. Irides brown. Head, cheeks, and throat brown, glossed with purple. A black stripe on the hind neck, bordered with white, the latter colour meeting with the white of the breast and belly. Back waved with black and grey. Scapulars nearly black. Quills dusky brown; secondaries purplish-green, black near the end, and tipped with white. Tail of 16 pointed feathers, grey, edged with white; the two middle ones black. *Female* less; head and neck brown, with dusky spots; beneath yellowish-brown and spotted. *Young* males like the female. Retires to the Arctic Regions in summer.—Easily domesticated, and breeds in confinement.

190. A. *Penelope*. Wigeon.—Bill and feet blue. Wing-spot black, green in the middle.

Penelope, *Will.* Orn. 288.—A. Penelope, *Linn.* Syst. i. 202. *Penn.* Brit. Zool. ii. 601. *Temm.* Orn. ii. 840. (Trachea, Linn. Trans. iv. tab. xiii. f. 9.)—*E*, Whewer, Pandle-whew, Yellow Pole.—*S*, Ateal; *W*, Chwiw. —A regular winter visitant.

Length 20, breadth 35 inches; weight 24 ounces. The nail of the bill is black. The hind-toe has a narrow web. Irides brown, vermiform appendages, nearly 9 inches in length, and having their origin nearly 4 inches from the cloaca. Crown yellowish-white; head and neck chesnut, the front with black spots; breast vinaceous; belly white; back and sides waved black and white; wing-covers white, the greater covers with black ends. Quills dusky, secondaries green, ending with black. Tail of 14 pointed dusky feathers; under tail-covers black. *Female*, with the head and neck brown, spotted with black; back and belly much tinged with brown; the wing-spots grey. The *young* resemble the female. In aged males the yellow on the crown becomes more extended.—This species frequents inlets of the sea, and likewise visits the neighbouring fresh-water lakes. The figure given by Pennant of the " Ferruginous Duck," was probably taken from a male wigeon in the first year's plumage.

191. A. *Querquedula*. Garganey.—Bill black, feet grey. Wing-spot greyish-green, with white borders.

Quer. prima, *Will.* Orn. 291. *Sibb.* Scot. 21.—A. Quer. *Linn.* Syst. i. 203. *Penn.* Brit. Zool. ii. 604. *Temm.* Orn. ii. 844.—(Trachea, Linn. Trans. iv. tab. xiii. f. 2, 3.)—*E*, Pied Wigeon, Summer Teal, Crucket Teal.—*W*, Hwyad addfain.—A winter visitant.

Length 17, breadth 28 inches; weight 14 ounces. Irides brown. Crown, nape, and chin black, with white dots. Front, cheeks, and fore-neck brown; a white stripe from the eye down each side of the neck. Breast and back brown, with semicircular black bars. Belly white, or yellowish; sides waved, vent mottled with dusky. Wing-covers grey, with white margins. Tail of 14 pointed feathers. *Female* brown, the eye-stripe spotted. The *young* like the female.—It is probable that it breeds in England, as Montagu "received it from the decoys of Somersetshire, in the month of April, by the name of Summer Teal, and was informed that it made its appearance on those pools always about that time," (Orn. Dict.).—According to Mr Low, it is common in Orkney, during the winter, in stormy weather.

192. A. *Crecca*. Teal.—Bill dusky; feet grey. Wing-spot green and black, with two white bands.

Querquedula secunda, *Will.* Orn. 290. *Sibb.* Scot. 21.—A. crec., *Linn.* Syst. i. 204. *Penn.* Brit. Zool. ii. 606. *Temm.* Orn. ii. 846; (Trachea, Linn. Trans. iv. tab. xiii. f. 1.)—Resident on fresh-water lakes.

Length 15, breadth 27 inches; weight 14 ounces. Head and neck chesnut; chin black. From the eyes, down each side of the neck, a broad stripe of glossy purplish-green, ending on the hind neck in a patch of purplish-black. Between the green and brown, under the eye, a white line. Lower part of the neck, sides, and back, waved with black and white. Breast reddish-white, with round black spots. Belly yellowish-white. Vent black, with yellowish-white sides. Quills dusky; secondaries green and black, the foremost edged with white; their covers with reddish-white ends; scapulars black and white. Tail of 16 pointed dusky feathers. (I have found 18 in one specimen which had the purplish-black patch on the hind neck.) *Female* with brown plumage; the eye-stripe reddish-white, with brown spots; throat white.—Nest among rushes. Eggs 12, reddish-white, with brown spots.—*Young* like the female.

193. A. *glocitans*. Bimaculated Duck.—Bill blue. Feet yellow, with black webs. Wing-spot green, divided by black, and ending in white.

Penn. Brit. Zool. ii. 602. tab. c. no. 287.—Querquedula glocitans, *Vigors*, Linn. Trans. xiv. 559.—A rare winter visitant.

Length 20, breadth 25 inches. Length of the bill to the front $1\frac{9}{10}$ths, of the gape $2\frac{1}{10}$th inches. Head a changeable green, with a ferruginous spot before and another behind the eye. Breast rusty-brown, spotted with black. Hind neck and back waved with black and brown. Wing-covers and quills grey; the secondaries green, ending in a shade of black, and edged with white. Tail of 16 feathers (12 according to Pennant), brown, edged with white; the two middle ones black, and a little produced. The *female* has the head reddish-white, with black lines; the back brown, with light edges; the two middle tail-feathers not produced. The specimen described by Pennant was sent to him, in 1771, from a decoy by Mr Poore. Two specimens, supposed male and female, came into Mr Vigors' possession, which were taken in a decoy near Malden, Essex. They were purchased in Leadenhall market, in the winter of 1812-13, by Mr George Weighton. The history of this species is still involved in obscurity.

GEN. LXXXVIII. CYGNUS. SWAN.—Bill of nearly equal breadth throughout; the nostrils near the middle; neck long.

194. C. *ferus*. Wild Swan.—Base of the bill destitute of a protuberance.

Will. Orn. 272. *Sibb.* Scot. 21.—Anas Cygnus, *Linn.* Syst. i. 194.—*Penn.* Brit. Zool. ii. 562. *Temm.* Orn. ii. 828.—*E*, Elk, Hooper, Whistling Swan; *W*, Alarch gwyllt.—A winter visitant.

Length 58, breadth 84 inches; weight 25 pounds. Bill nearly 5 inches in length, black, yellow on the sides, at the base, reaching nearly to the eye, and a triangular yellow spot above. Feet black. Windpipe enters a cavity in the breast-bone, and is reflected before terminating in the bronchiæ. — (Phil. Trans. lvi. tab. x. f. 1., and Lin. Trans. iv. tab. xii. f. 1, 2.) Irides brown. Plumage white; the head and neck sometimes tinged with yellow. The *female* is less.—Nest in rushes, on the margin of lakes. Eggs 5, olive-green, with a white crust.—The *young* have the plumage grey; the naked space before the eyes livid, and the feet grey, with a tinge of red. A few pairs of this species formerly bred in the Loch of Stennis, Orkney.

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The *Cygnus mansuetus*, or Tame Swan, a native of eastern Europe and Asia, may be enumerated among our domesticated birds, though it be but half reclaimed. It is larger than the preceding, and is readily distinguished by a black callous knob at the upper base of the bill. This species has been long esteemed as highly ornamental on pieces of water in pleasure grounds.

GEN. LXXXIX. ANSER. GOOSE.—Bill conical; shorter than the head.

* *Bill and legs coloured.*

195. A. *palustris*. Grey Goose.—Bill and legs flesh-coloured; nail and claws white; wings not reaching to the end of the tail.

Lister, Phil. Trans. xv. no. 175. p. 1159.—*Ray*, Syn. Av. 138. *Penn.* Brit. Zool. ii. 570.—Anas Anser ferus, *Temm.* Orn. ii. 818.—*E*, Grey Lagg; *S*, Stubble Goose.—Resident, breeding in the fen counties of England.

Length 2¾, breadth 5 feet; weight 10 pounds. Bill large and elevated. Iridis grey. Head, neck, back, and rump, grey; feathers on the neck loose and furrowed. Breast and belly white, clouded with grey. Wing-covers white, or grey, edged with white. Quills grey, tipped with black, and edged with white; secondaries black. Tail feathers dusky, tipped with white, the exterior ones nearly all white; upper and under covers white. *Female* smaller.—Nest in marshes. Eggs 8, of a dirty white colour. In Lincolnshire these birds are resident; but, in other places, they retire during the breeding season.—This species, as the only permanently resident one, and the *young* of which could be taken and tamed, was reclaimed, at an early period, and is the stock of our domestic geese. Lister, in describing this species, says, " Rostrum a capite ad mediam fere partem nigrum, deinde subpurpureum, ipso ejus apice nigro."—" Pedes subpurpurei sive carnei coloris; ungues fere albidi excepto medii digiti, qui ex majore parte nigricat."

196. A. *ferus*. Wild Goose.—Middle of the bill and legs

orange; base of the bill, nail, and claws black. Wings reaching beyond the end of the tail.

Scotch Goose; sc. vulgatissimus ferus, *Lister*, Phil. Trans. xv. 1159.—*Will.* Orn. 274. *Ray*, Syn. Av. 136.—Bean Goose, *Penn.* Brit. Zool. ii. 575.—A. segetum, *Temm.* Orn. ii. 820.—*E*, Common Wild Goose, Bean Goose, Small Grey Goose.—A regular winter visitant.

Length 2$\frac{7}{12}$ths, breadth 4$\frac{11}{12}$ths feet; weight 6$\frac{1}{2}$ pounds. Bill depressed, compressed near the end. Irides brown. Head and neck grey, inclining to brown above. Back, scapulars, and wing-covers grey, with pale margins, and tinged with brown. Rump dusky. Quills black; the outer webs grey; secondaries grey, with black margins; belly and tail-covers white. Breeds in the Arctic Regions. The *young* have the neck yellowish, and the front spotted with white. This species arrives in autumn, and departs in spring, frequenting wheat fields. It is named, in Lincolnshire, *Bean* Goose, from the resemblance which the black nail of the bill bears to a horse bean.—Linnæus confounded this species with the preceding, under the title *Anas Anser.* I have adopted the names of Ray, who, by the assistance of Lister, clearly distinguished the two species.

197. A. *Erythropus.* Laughing Goose.—Bill and feet orange; the former with a white nail. Front white.

Anas eryth. *Linn.* Syst. i. 197.—White-fronted Goose, *Penn.* Brit. Zool. ii. 576.—Anas albifrons, *Temm.* ii. 821.—A regular winter visitant.

Length 2$\frac{1}{3}$, breadth 4$\frac{1}{2}$ feet; weight 5 pounds. Head and neck greyish-brown. Back and sides brown, with pale margins. Quills black; the secondaries tipped with black. Breast and belly white, with scattered black feathers. Vent and tail-covers white. Tail dusky black; the outer feathers nearly white; the rest edged with that colour. The *young* have generally three white spots in front. This species keeps in small flocks during the winter, and is killed on the coast, and in rivers, in severe winters.

** *Bill and legs black.*

198. A. *Bernicla.* Bernacle or Claikis.—Head white; neck and breast black.

Bernacle, *Lister*, Phil. Trans. xv. 1159.—Bernicla, *Will.* Orn. 274.—*Sibb.* Scot. 21.—*Penn.* Brit. Zool. ii. 577.—Anas leucopsis, *Temm.* Orn. ii. 823.—A winter visitant.

Length 2$\frac{1}{12}$th, breadth 4$\frac{5}{12}$ths feet; weight 5 pounds. Irides dark brown. Back, scapulars, and wing-covers, grey, black, and white; below white. Quills and tail black. The *young* birds have a dark stripe from the bill to the eye, and the white of the head is mottled with dusky. This species retires early. It is celebrated in the annals of ignorance, as the bird supposed to be bred from the bernacle shell.

199. A. *Brenta.* Brent Goose.—Head, neck, and breast black. A white patch on each side the neck.

Wilk, *Lister*, Phil. Trans. xv. 1159.—Brenta, *Will.* Orn. 275.—*Penn.* Brit. Zool. ii. 579.—Anas Bernicla, *Temm.* Orn. ii. 824.—*E*, Rat or Road Goose, Glatter Goose.—A winter visitant, frequenting meadows and grass fields.

Length 29 inches, weight 2$\frac{3}{4}$ pounds. Irides dark-brown. Lower part of the breast, back, scapulars, and wing-covers, mottled ash-colour; middle of the belly greyish-brown; sides grey. Vent and under tail-covers white. Rump and tail black. The *young* are destitute of the white patch on the side of the neck, and the feet have a reddish tinge. Linnæus confounded this and the preceding species, under the title *Anas Bernicla*, although they had previously been well distinguished by Willoughby. Temminck censures Linnæus for bestowing the trivial name *erythropus* on the bernacle. The error, however, does not belong to Linnæus. Had the celebrated Dutch naturalist looked at the description of Linnæus, he would have found, that, under the name *erythropus*, the laughing goose is well described; and, had he glanced at the pages of Willoughby, he would have perceived the inexpediency of adopting the epithet " Leucopsis," from Bechstein, as " Bernicla" had long preoccupied its place; and avoided the employment of " Bernicla" to designate the " Brenta."

As a straggler, the *Anser ruficollis*, (Anas ruficollis Red-breasted Goose, *Temm.* Orn. ii. 826.), here merits a place. It may readily be distinguished by its brown bill, with the black nail and feet. The crown, throat, belly, and tail black; the vent, rump, and tail-covers white; the front of the neck and breast red. This species, a native of eastern and northern Europe, has been two or three times found in this country. One was shot near London, in 1766, and another taken alive in Yorkshire, according to Montagu. One was shot near Berwick-upon-Tweed, by Mr Burney, gunsmith, and sent to Mr Bullock, in whose possession I saw it in May 1818.

Several species of geese have likewise been imported, and continue in a domesticated state; among which may be reckoned,

1. A. *Gambensis*. Egyptian, Ganser, or Gambo Goose, *Will.* Orn. 275.—Bill red; the throat, cheeks, and upper part of the head are white; the back, rump, and tail are glossy black; each wing has a blunt spur on the bend.—Introduced from Africa.

2. A. *Canadensis*. Canada Goose, *Will.* Orn. 276.—Bill black; head and neck black; a white crescent on the throat. Back greyish-brown. Belly, vent, and tail-covers white. Tail black.—Introduced from North America.

3. A. *Hispanicus*. Chinese, Spanish, Guinea, or Swan Goose. *Will.* Orn. 275.—Bill orange at the base, with a large knob. A wattle under the throat. A dark-brown stripe from the nape to the back. Deportment stately.—Native country doubtful.

GEN. XC. MERGUS. GOOSANDER.—Bill narrow. Hind-toe with a fin. Nostrils near the middle of the bill.

200. M. *Merganser*. Green-headed Goosander.—Bill and legs red. Breast and wing-spot white.

Merganser, *Will.* Orn. 253.—Mergus Mer. *Linn.* Syst. i. 208.—*Penn.* Brit. Zool. ii. 556.—*Temm.* Orn. ii. 881.—*E*, Jack-saw; *W*, Hwyad ddan heddoy; *N*. Harle.—Breeds in Orkney and the Hebrides.—A winter visitant of other districts.

Length 28, breadth 38 inches; weight 4 pounds. Bill crimson, narrow before the nostrils; ridge and nail dusky. Mouth orange. Feet scarlet; the nails dusky. Irides chesnut. Head and neck deep duck-green, becoming black under the chin. Lower neck, shoulders, and below white, tinged with cream yellow. Feathers on the nape loose, and slightly produced. Primaries, and their covers, brownish-black. The foremost secondaries black; the middle ones white; the inner ones, which are long and pointed, are white, edged with black. First covers of the secondaries white, with a black base; the second white; those at the shoulder dusky, with pale edges. Inner scapulars black; outer ones white. Upper back deep black, verging to grey at the rump. Tail of 18 grey pointed feathers. The *female*, which is the *Dundiver* (Mergus castor) of British writers, has a long crest. The head, and upper part of the neck ferruginous; throat white; below, white tinged with yellow, above grey.—Nest on the margin of fresh water lakes. Eggs 12, white. *Young* like the *female*. The young males, in female garb, have led several zoologists to conclude, that the M. Castor was a distinct species. The inquiries, however, of an acute and intelligent naturalist, the late Mr Simmonds, (cut off in the prime of life, in the Island of Barbadoes, while actively engaged in zoological researches), conducted, as I can testify, with great caution, enabled him to set the question at rest, by proving an identity in the structure, number, and dimensions of the tracheæ of the males, the vertebræ of the neck, the intestines, and the tail-feathers, Linn. Trans. viii. 268. Mr Low mentions a variety of the goosander, in which the whole head, neck, and breast were black.—Ork. 132.

201. M. *Serrator*. Red-breasted Goosander.—Bill and legs red. Breast red. Wing-spot white, divided by black bands.

M. cirratus fuscus, *Will.* Orn. 255.—M. ser. *Linn.* Syst. i. 208.—*Penn.* ii. 558.—*Temm.* ii. 884. (Trachea, Linn. Trans. iv. tab. xvi. f. 1, 2,)—*E*, Lesser Toothed Diver.

Length 21, breadth 31 inches; weight 2 pounds. Bill dusky on the ridge; claws black. Irides purplish-red. Head and throat fine green. Crest long. Fore-neck and belly white. Breast brown, spotted with black. Upper back black; lower, and rump, mixed brown and grey. Outer scapulars black; the inner white. In front of the wing, a group of white spots. The white on the wing divided by two black bands. Tail short and brown.—*Female* with the head and neck reddish-brown; the throat white. Fore-neck and breast mixed grey and white. Wing-spot divided by one black band.—Nest on the margin of lakes. Eggs 8, bluish-white. The *young* may be distinguished from the preceding, by the black band on the wing-spot, and the trachea of the males having only one enlargement in the middle.

202. M. *albellus*. White-headed Goosander.—Bill and legs lead-coloured. Head, neck, and breast white. Cheeks green. Nape black. Wing-spot white, divided by black bands.

Albellus alter, *Will.* Orn. 254.—M. alb. *Linn.* Syst. i. 209.—*Penn.* Brit. Zool. ii. 559.—*Temm.* Orn. 887. (Trachea, Linn. Trans. iv. tab. xvi. f. 3, 4.)—*E*, Smew, White-nun, Vare-wigeon.—Winter visitant.

Length 18, breadth 26 inches; weight 34 ounces. Bill about 2 inches long. Irides brown. Belly and scapulars white. Back, and two crescents on the side of the breast black. Tail grey. *Female* (M. minutus, Linn.) less. Crown, cheeks, and nape reddish-brown. Fore-neck and belly white; lower neck, breast, sides, and rump grey.—Does not breed in this country. Eggs 8, white. *Young* like the *female*.

GEN. XCI. ALCA. AUK.—Base of the bill closely covered with short feathers. Nostrils situate on the feathered space, immediately above and behind the marginal and basilar ridges.

203. A. *impennis*. Great Auk.—Wings not reaching to the rump. Bill black. An oval white patch in front of the eye.

Gair-fowl, *Martin's* St Kilda, 48.—Penguin, *Will.* Orn. 242.—Northern Penguin, *Edward's* Birds.—A. im. *Linn.* Syst. i. 210. tab. 147.—*Penn.* Brit. Zool. ii. 507.—*Temm.* Orn. ii. 939.—*S*, Gair-fowl, King of the Auks.—Breeds occasionally in St Kilda.

Length 3 feet. Bill, dorsally, 3, in front of the nostrils 2¼, in the gape 4½, depth 1⅝ inches; 7 ridges in the upper, and 11 in the lower mandible. Legs black. Irides chesnut; margin of the eye-lid black. Inside of the mouth orange. Head, back, and neck black, the latter with a brownish tinge. Quills dusky; secondaries tipped with white. Breast and belly white. In winter, the brownish-black of the throat and fore-neck is replaced by white, as I had an opportunity of observing in a living bird, brought from St Kilda, in 1822.—(See Edin. Phil. Jour., vol. x. p. 97.) This bird occasionally visits the Orkney Islands, as witnessed by Mr Bullock (*Mont.* Orn. Dict. Supp.) I have been informed by the same observer, that an individual was taken in a pond of fresh water, two miles from the Thames, on the estate of Sir William Clayton, in Buckinghamshire. When fed, in confinement, it holds up its head, expressing its anxiety by shaking the head and neck, and uttering a gurgling noise. It dives and swims under water, even with a long cord attached to its foot, with incredible swiftness.

204. A. *Torda.* Razor-Bill.—Wings reaching to the rump. Bill black, with a white band. A narrow white stripe in front of the eye.

Falk, *Martin's* St Kilda, 61,—A. Hoieri, *Will.* Orn. 242.—*Sibb.* Scot. 20.—A. Tord. *Linn.* Syst. i. 210.—*Penn.* Brit. Zool. ii. 509.—*Temm.* Orn. ii. 936.—*E*, Auk, Murre; *S*, Marrot; *W*, Garfil, Gwalch y penwaig; *N*, Hioga.—Common on all parts of the coast.

Length 18, breadth 27 inches; weight 22 ounces. Bill 2 inches in the gape, 5 furrows in the upper, and 2 in the lower mandible; the groove in front of the basilar ridge of the upper mandible deep. Feet and claws black. Mouth orange. Irides chesnut. Head, neck, and back black; the throat and fore-neck tinged with brown. Breast, belly, sides, and tips of the secondaries white. Tail-feathers 14. In the winter, the throat, front, and sides of the neck become white. *Female* similar.—Breed gregariously on the shelves of rocks impending the sea. Egg 1, white, tinged with green. *Young*, when from the nest, differ from the old birds chiefly in the chin being freckled with white; the bill being nearly smooth, narrow, and destitute of the white band; and the stripe of white before the eyes being distinct. After this bird assumes the winter dress, and before the bill acquires the dimensions and markings of maturity, it constitutes the Black-billed Auk (A. Pica, Linn. Syst. i. 210.) of several British ornithologists.

GEN. XCII. FRATERCULA. COULTERNEB.—Base of the bill, and part of the cheeks, covered with a coloured skin. Nostrils situate on the smooth space, and immediately above the marginal, and in front of the basilar ridge.

205. F. *arctica.* Common Coulterneb.—Cheeks, chin, breast, and belly white; the crown, neck, and back black.

Bouger, or Coulterneb, *Martin's* St Kilda, 62.—Anas arctica, *Will.* Orn. 244.—*Sibb.* Scot. 20.—Alca arct. *Linn.* Syst. i. 211.—*Penn.* Brit. Zool. ii. 512.—Mormon Fratercula, *Temm.* Orn. ii. 933.—*E*, Pope, Puffin, Mullet, Sea-Parrot, Willock; *S*, Tammie-Norrie; *W*, Proffingen.—Regular summer visitant.

Length 12, breadth 21 inches; weight 12 ounces. Bill short, wide at the base, compressed towards the point; dorsal ridge thin and bent; fore-half yellowish-red, with two or three furrows; basal half smooth and black; basilar ridge yellowish-white, punctured. Legs and margin of the eye-lid reddish-orange. Above and below the eye, a naked space of black skin. Irides grey. Tail short, of 16 feathers. *Female* similar.—Nest in deserted rabbit-holes, or burrows which the bird forms. Egg 1, white. *Young* have the markings of the bill less distinct.—Mr Pennant remarks, " The size of the bills of these birds varies; those of Priestholme Isle are one inch and three quarters long; and the base of the upper mandible one inch broad; but, in the birds from the Isle of Man, these proportions are much less." Have we two species?

GEN. XCIII. PODICEPS. GREBE.—Bill straight, produced, firm, pointed. Nostrils pervious. No tail. Plumage of the belly close, with a silvery gloss.

206. P. *cristatus*. Crested Grebe.—Bill longer than the head; from the nostrils to the tip 17 or 18 lines; red, white at the tip.

Colymbus major, *Will.* Orn. 256.—Col. crist., *Linn.* Syst. i. 222.—Tippet and Great Crested Grebes, *Penn.* Brit. Zool. ii. 496.—P. crist., *Temm.* Orn. ii. 717.—*E*, Greater Loon, Arsfoot, Gargoose, Gaunt; *W*, Gwyach.—Breeds in England.

Length 21, breadth 30 inches; weight 2½ pounds. Bill 2¼ inches. Feet black, yellowish on the inside. Irides and lores crimson. Face white. Crown, nape, and ear-crests glossy black, the latter tinged with brown. Beneath white. Above dusky brown. Primaries dusky; secondaries white, except the two first, which are dusky. *Female* less, with a smaller crest, and duller colours.—Nest in marshes, of aquatic plants, and made so as to float. Eggs 4, white, of the size of those of a pigeon. *Young* without the crest, the face with zig-zag lines of a dusky colour. In this state, it is the Col. urinator of Linnæus.—This species breeds in Shropshire and Lincolnshire. It seems to be stationary even in Zetland. One which I examined, 13th January 1809, had the stomach full of gammari.

207. P. *rubricollis*. (Latham.) Red-necked Grebe.—Bill the length of the head; from the nostrils to the tip 11 lines; yellow at the base; tip black.

Bewick's Brit. Birds, ii. 152.—*Temm.* Orn. ii. 720. A winter visitant.

Length 17 inches; weight 23 ounces. Bill 2 inches long. Legs dusky, yellowish on the inside. Irides hazel. Front, crown, nape, and hind-neck, black; cheeks and throat grey; fore-neck and breast reddish-chesnut; belly white, the sides with dusky spots; back and wings black; the secondaries and base of the wing white. Nape with a short crest. *Female* similar.—Nest like the preceding. *Young* with the throat and cheeks white; the fore-neck grey; the sides and hind-neck dusky.—This species, which occurs both in England and Scotland, seems to have been met with, hitherto, only in the winter season. Pennant was inclined to consider it as a variety of the Crested Grebe.

208. P. *cornutus*. Horned Grebe.—Bill stout, shorter than the head, compressed throughout; from the nostrils to the tip 6 or 7 lines. Iris double.

Col. major cristatus et cornutus, *Will.* Orn. 257.—Sclavonian Grebe, *Mont.* Orn. Dict. Suppt.—P. corn. *Temm.* Orn. ii. 721.—Resident and common.

Length 14, breadth 25 inches. Bill black, point red, and the outline slopes regularly. Feet black, grey within. Irides crimson, bordered and shaded with white. Lores crimson. Crown and crest black; a large tuft of bay feathers originate at the base of the bill, and along the eye, increasing in length, and spreading like ears. Front, neck, and breast, red; back black; belly white; the sides rufous. Wings black, secondaries white. *Female* similar.—Nest like the preceding. *Young* destitute of crest or auricles; lores white; above dusky; neck without red; bill corneous.—In the stomach of a young male, shot 18th January 1809, I found a concretion upwards of half an inch in diameter, consisting of its own belly feathers, closely matted together. Montagu, in his Suppt. states, that he has observed the same occurrence in the red necked and crested species. Are these to be considered as analogous to bezoars?

209. P. *auritus*. Eared Grebe.—Bill shorter than the head, black, depressed over the nostrils; a little recurved; from nostrils to the tip 6 or 7 lines.

Col. aur. *Linn.* Syst. i. 222.—Eared and Dusky Grebes, *Penn.* Brit. Zool. ii. 500. and 501.—P. aur. *Temm.* Orn. ii. 725.—Resident.

Length 12, breadth 22 inches; weight 1 pound. Bill about an inch; the ridge of the upper mandible nearly straight at the end, the lower one sloping upwards, giving the bill a subrecurved appearance. Irides scarlet; lores reddish. Face, crown, and short crest, black. Auricular tuft yellow, shaded to orange, taking its rise behind the eye. Throat, neck, sides of the breast, and back, black; sides chesnut; belly white. Legs, without, dusky, the inside greenish. *Female* similar.—Nest and eggs like the preceding, but smaller. The *young* are like those of the Horned Grebe; but the shape of the bill and colour of the irides serve to distinguish them at all ages.

210. P. *minor*. Little Grebe.—Bill very short, stout, compressed; from the nostrils to the tip 5 lines.

Will. Orn. 258.—Little Grebe and Black-chin, *Penn.* Brit. Zool. ii. 501. —Col. Hebridicus, *Sower.* Brit. Misc. tab. 70.—P. minor, *Temm.* Orn. ii. 727.—*E*, Didapper, Dipper, Dobchick, Douker, Small Loon or Arsfoot.—Resident.

Length 10, breadth 16 inches; weight 6 ounces. Bill about an inch, black; the base of the lower mandible and lores whitish; feet greenish outwardly, tinged with red on the inside. Irides reddish-brown. Crown, nape, and throat, black; side and fore-neck chesnut; breast and sides dusky; belly greyish; thighs and rump reddish. Dorsally glossy black, tinged with olive. Primaries greyish-brown; secondaries white on the inner webs. *Female* similar.—Eggs 5 or 6, white, covered up when the parent leaves the nest. The *young* have the head and neck white, mottled with brown.

GEN. XCIV. COLYMBUS. DIVER.—Tail short, rounded. Tarsus much compressed.

211. C. *glacialis*. Northern Diver.—Bill upwards of 4 inches in length; its ridge above the nostrils carinated; under mandible deepest in the middle.

C. maximus caudatus, *Will.* Orn. 258.—C. m. stellatus, *Sibb.* Scot. 20.—C. glacialis, *Linn.* Syst. i. 221. *Penn.* Brit. Zool. ii. 523. *Temm.* Orn. ii. 910.—*E*, The Greatest Diver, Loon; *S*, Herdsman of the Sea, Emmer Goose; *G*, Mur-buachaill.—On the coast, during winter chiefly.

Length 41 inches, breadth 5 feet; weight 10 pounds. Bill dusky, the ridge of the upper mandible slightly bent downwards, especially at the apex; the ridge of the lower mandible sloping upwards, giving the bill a recurved aspect; the grove at the symphysis continued to within about 3 lines of the tip. Feet, on the outside, dusky; pale within. Irides brown. Tongue entire, pointed. Vermiform appendages 1 inch long, and upwards of ½ inch broad. Head and neck black, the latter with two collars, white, freckled with black. Back black, with white spots. Breast and belly white. Tail of 20 feathers. *Female* similar, but less.—Nest on the margin of fresh-water lakes. Eggs 2, isabella yellow, with purplish-grey spots. *Young* differ in the plumage above, being brownish-black, freckled with grey on the cheeks, and the feathers on the back edged with grey; below, white, with a dusky bar across the vent. In this state it is the *C. immer* of Linné. The black on the neck, the collars, and the white spots on the back, appear as the bird approaches maturity, which it reaches at the age of 3 years.—The young of this species are common in Zetland, during winter, while old birds seldom occur. In Orkney, however, both old and young birds abound at that season. The old birds visit the Frith of Forth in winter, following the herrings. The young birds are occasionally seen in summer in the Zetland seas, and I observed one off the coast of Waterford, 28th July 1816.

212. C. *arcticus*. Black-throated Diver.—Bill upwards of 3 inches in length; flat above the nostrils; groove of the symphysis reaching to the end of the lower mandible.

Will. Orn. 258. *Sibb.* Scot. 20. *Linn.* Syst. i. 221. *Penn.* Brit. Zool ii. 527. *Temm.* Orn. ii. 913.—A winter visitant.

Length 27, breadth 44 inches; weight 4 pounds. Bill black, nearly 3½ inches long, rounded, blunt. Feet brown outwardly, whitish within. Irides brown. Front, throat, fore-neck, back, and rump, black. Crown and nape grey. Sides of the neck spotted black and white. Sides of the back scapulars and wing-covers black, with white spots. Tail feathers 20. *Female* similar.—Nest on the margin of lakes. Eggs 2, white, with distant black spots. The *young* are dusky above, and white below, at first; the head then becomes grey, and the sides of the neck freckled with black. At two years, the black on the fore-neck, and the black and white of the back, make their appearance; and the plumage is complete in 3 years. When approaching maturity, it appears to be the Second Speckled Diver of Bewick.

213. C. *septentrionalis*. Red-throated Diver.—Bill scarcely 3 inches long, slender, pointed, subrecurved; groove of the symphysis of the lower mandible very short.

Linn. Syst. i. 220. *Penn.* Brit. Zool. ii. 526, *Temm.* Orn. ii. 916.—*S*, Rain Goose.—Breeds in Orkney and Zetland. A winter visitant of the Thames.

Length 24, breadth 41 inches; weight upwards of 3 pounds. Bill black, much more pointed, slender, and recurved, than the two preceding species; the margins are much incurved. Legs black without, whitish on the inside. Irides reddish-brown. Crown, nape, and back of the neck, purplish-black, the edges of the feathers white and raised. Chin, cheeks, and sides of the neck, dark grey. Fore-neck brownish-red; above, olive-black, with pale edges; wing covers dusky, with white spots. Breast and belly silvery. Vent with a black bar. Tail of 20 feathers; the under covers black, with pale edges. *Female* similar.—Nest on the margin of lakes. Eggs 2, olive brown, with brown spots. *Young*, at first, dusky above, whitish below; they then assume the grey on the head, and become spotted on the back; and, on approaching maturity, the red on the throat appears. In its immature state it is the "First Speckled Diver" of Bewick. Linnæus states, that, in Sweden, the Black Throated Diver was considered as the male of this species. I have seen the Red and Black Throated Divers in company with a young bird, and had evidence of the Red Throated individual being a female. They have likewise been shot in company in the spring. (Mont. Orn. Dict. Suppt. and Edin. Phil. Journ. vol. viii. 299.) These circumstances seem calculated to excite more inquiry respecting the specific characters of the species of the genus.

GEN. XCV. URIA. GUILLEMOT.—Bill straight, compressed, pointed, margins incurved; the upper mandible, with a distinct terminal notch.

214. U. *Troile.* Foolish Guillemot. — Head, neck, and throat, dull blackish-brown; above, brownish-black; breast and belly white.

Lavy, *Martin's* St Kilda, 59.—Lomwia Insulæ Farræ, *Will.* Orn. 244. *Sibb.* Scot. 20.—Col. Troile, *Linn.* Syst. i. 220. *Penn.* Brit. Zool. ii. 519.—Uria Tr. *Temm.* Orn. ii. 921.—*E*, Guilem, Guillemot, Sea Hen, Skout, Kiddaw, Murse, Willoch, Tinkershere.—*S*, Marrot, Skutock; *W*, Gwilym; *N.* Lungy.—Common on all the coasts.

Length 18, breadth 28 inches; weight 24 ounces. Bill black; from the nostrils to the tip an inch and a half; gape 3 inches; inside orange. Tongue nearly the length of the bill, pointed. Vermiform appendages, short, pointed. Legs, behind, and soles, black; before and above, yellowish-brown. Primaries pale towards the base; the secondaries tipped with white. Tail short and rounded, of 12 feathers. In winter the black on the throat and fore-neck is replaced by white, and the plumage above has a greyish tinge. *Female* less.—Nest on the ledge of a rock on the shore. Egg 1, greenish, blotched with dusky.—*Young* with the bill short; sides and front of the neck whitish like the old birds in their winter garb. In this state it is the Lesser Guillemot of British writers.

* * *

It is probable that the Uria Brunnichii (*Temm.* Orn. ii. 924.), may occur during the winter season, especially among the northern islands. The dilated broad base of the bill, and the white of the belly extending to an arrow-shaped point on the fore-neck, may serve to distinguish it. The throat, however, probably becomes white in winter.

GEN. XCVI. CEPHUS. SCRABER.—Bill longer than the head; upper mandible destitute of the terminal notch.

215. C. *Grylle.* Common Scraber.—Bill straight, narrow; wing-covers forming a large white spot.

Scraber, *Martin's* St Kilda, 58.—Columba Groenlandica, *Will.* Orn. 245. *Sibb.* Scot. 20.—Col. Grylle, *Linn.* Syst. i. 220. *Penn.* Brit. Zool. ii. 521.—Uria Gr. *Temm.* Orn. ii. 925.—*E*, Greenland Dove, Sea Turtle; *S*, Scraber, Toyst, Tystie.—Common.

Length 14, breadth 22 inches; weight 14 ounces. Bill black, an inch and a half long. Mouth and legs orange. Irides hazel. Plumage black, except the large wing spot and tips of the secondaries, which are white. Tail of 12 feathers. In winter the plumage becomes mottled with white. In Greenland it becomes wholly white, as was pointed out to me by Sir Charles Giesecke, in the collection of the Dublin Society, in a specimen which he brought from that country. In this state, it is the Spotted Guillemot of Pennant. *Female* similar.—Nest on ledges of rocks; chiefly in caves. Egg 1, white, with black and grey spots.—*Young* resemble the winter plumage of the old birds.—In Zetland I have observed the birds with black plumage about the end of February; by the end of March they are common in this their summer dress.

GEN. XCVII. MERGULUS. ROTCHE.—Bill shorter than the head; ridge arched; symphysis short and oblique; margins inflected.

216. M. *melanoleucos*. Common Rotche. — Breast, belly, and a dot above the eyes, white; the rest of the plumage black.

Will. Orn. 261.—Alca Alle, *Linn.* Syst. i. 211.—Little Auk, *Penn.* Brit. Zool. ii. 517.—Uria alle, *Temm.* Orn. ii. 928.—*E*, Little black and white Diver.—A winter visitant of the northern coasts.

Length 9, breadth 16 inches; weight 5 ounces. Bill black, short and thick, like gallinaceous birds. Legs and toes yellowish. Irides hazel. Tip of the secondaries white. In this, its summer dress, it was considered as a *var.* by Pennant. In a specimen from Greenland, presented to me in 1809, by that accomplished navigator Captain Scoresby *jun.*, I was able to perceive the series of changes which the plumage of this bird undergoes in connection with the seasons, the results of which were communicated to Montagu, (Orn. Dict. Suppt.) In winter, the throat, sides, and front of the neck, become white, more or less freckled with dusky; in which state it is frequent on our shores. *Female* similar.—Nest in holes or crevices on the bare rocks. Egg 1, bluish-green.

GEN. XCVIII. PROCELLARIA. PETREL.—Nostrils united into a single tubular opening on the upper part of the bill. Lower mandible truncated.

* *Nail of the bill prominent, arched and toothed on the margin. Tail rounded.* FULMAR.

217. P. *glacialis*. Fulmar Petrel.—Tail rounded; plumage, above, grey; beneath, white.

Haffert, *Will.* Orn. 306.—Fulmar, *Martin*, Descr. West Isles, p. 283.—P. gl. *Linn.* Syst. i. 213. *Penn.* Brit. Zool. ii. 549. *Temm.* Orn. ii. 802.—*N*, Mallemacke.—Breeds in St Kilda.

Length 17 inches; weight 22 ounces. Bill about 2 inches long, yellow, nail swollen. Legs dusky. Irides yellow. The head, neck, belly, rump, and tail, pure white; rest bluish-grey; the wings inclining to dusky. *Female* similar.—Nest in holes. Egg 1, white.—The *young* are grey, clouded with brown, with a dusky spot in front of the eyes. The fulmar feeds on fish and putrid carcases.

** *Nail of the bill not prominent Tail even or forked.* PETREL.

218. P. *pelagica*. Stormy Petrel.—Tail even, the wings, when closed, extending a little beyond its tip; length of the tarsus $\frac{7}{8}$ths of an inch.

Assilag, *Martin's* St Kilda, p. 63. *Linn.* Syst. i. 212. *Penn.* Brit. Zool. ii. 553. *Temm.* Orn. ii. 810. *Charles Bonaparte*, Journ. Acad. Sc. Phil. iii. pt. 2. p. 227. tab. viii. f. 1.—*E*, Stormfinch, Little Petril, Witch, Mother Cary's Chicken; *W*, Cas gan Longwr; *N*, Alamouti.—Resident.

Length 5½ inches. Bill black, half an inch in length; tube of the nostrils short, sunk at the base. Feet black. Irides dusky. Plumage sooty-black; the vent, each side, rump, and upper tail-covers, white; the tips of the last, the tail, and primaries, deep black; the greater wing-covers, and some of the secondaries, tipped with white. *Female* similar.—Nest in holes in rocks, or earth. Eggs 2, white.—The *young* are of a lighter colour: the feathers margined with reddish-brown. — This species frequents the seas of Europe. Breeds at many places on the coast. Follows the track of vessels in stormy weather, picking up the greasy substances in the wake. According to the observations of Mr Scarth, this bird makes a low purring noise in the breeding season. An individual, which he kept for some time in a cage, was supported by smearing the feathers of the breast with train oil, which the bird afterwards sucked with its bill. When the oil was placed in a saucer in the cage, the bird dipped its breast feathers therein, and afterwards sucked the oil from them.—Lin. Trans. xiii. 618.

219. P. *Bullockii.* Fork-tailed Petrel.—Tail forked, the wings, when closed, not extending beyond its tip; length of the tarsus one inch.

An undescribed Petrel, with a forked tail, taken at St Kilda in 1818, *Bullock's* Sale Cat. 8th day, No. 78.—P. Leachii, *Temm.* Orn. ii. 812. *Bonaparte*, Journ. Acad. Phil. iii. pt. 2. p. 299. tab. ix.—Inhabits St Kilda.

Length 8 inches. Bill black, robust, upwards of ¾ths of an inch long; the nasal tube even. Feet black. Plumage brownish-black, tinged with cinereous; the primaries and tail darkest; vent, each side, and upper tail-covers, white with brown shafts; wing-covers, some of the secondaries, and of the scapulars, gradually changing to dirty-white at the tip. *Female* similar.—This species extends over the Atlantic, and is common on the American coast. It was first observed and discriminated by Mr Bullock, during a voyage round the coast of Scotland in 1818, at St Kilda; and the specimen which he brought from thence, was, at the sale of his collection, purchased for the British Museum. At the latter place, M. Temminck had an opportunity of examining it, and proposed to Dr Leach to bestow on it the trivial name of "Leachii." When Dr Leach intimated this to me at the time, I remonstrated, but in vain, against his acceptance of a compliment to which he had no claim, and which he could retain only at the expense of another. Still entertaining the same views, I have ventured to alter the trivial name (as then proposed), in order to do an act of common justice to the individual who had energy to undertake a voyage of inquiry, and sagacity to distinguish the bird in question as an undescribed species.

* * *

The figure given by Borlase (Hist. Corn. tab. xxix. 10.) appears, from the length of the tarsi, and the wings extending greatly beyond the tail, to have been the *P. oceanica* of Forster. It is not improbable that the *P. Wilsoni* of Bonaparte, a species common on the American coast, may occur occasionally on the shores of the Hebrides or west of Ireland. The black feet, having a large oblong yellow spot on the web, may serve as a distinguishing mark.

GEN. XCIX. PUFFINUS. PUFFIN.—Nostrils with separate openings; extremity of the lower mandible bent downwards.

220. P. *Anglorum*. Manks Puffin.—Wings longer than the tail.

Will. Orn. 251.—Lyra, *Sibb.* Scot. 22.—Procellaria Puffinus, *Linn.* Syst. i. 213. *Penn.* Brit. Zool. ii. 551.—Proc. Ang. *Temm.* Orn. ii. 806.—*E*, Shearwater; *W*, Pwffingen Fanaw; *N*, Lyre, Scrabe.—A summer visitant.

Length 15, breadth 32 inches; weight 17 ounces. Bill an inch in length before the nostrils; blackish brown. Legs dusky without, yellowish on the inside. Plumage, above, black; beneath, white; the sides of the neck freckled black and white. *Female* similar.—Nest in holes. Eggs 1, white.—*Young* nearly resembling the old birds.—This species arrives at its breeding places in March, and departs in August. The young are very fat, and are sought after by the inhabitants, killed, salted, and eaten with potatoes or cabbage.

GEN. C. CATARACTES. SKUA.—Nostrils near the middle of the mandible, and covered with a corneous plate, reaching to the base. Claw of the inner toe arched.

Willoughby, with propriety, separated this genus from the following. —The species are bold, of rapid flight, and support themselves chiefly on the food which they compel the Gulls to vomit.

221. C. *vulgaris*. Common Skua.—Plumage brown; tail-feathers nearly equal.

C. noster, *Will.* Orn. 265. *Sibb.* Scot. 20.—Larus cat. *Linn.* Syst. i. 226. *Penn.* Brit. Zool. ii. 529.—Cat. vul. *Flem.* Edin. Phil. Journ. i. 97.— Lestris Cat. *Temm.* Orn. ii. 792.—*S*, Sea Eagle; *N*, Skua, Skui, Bonxie. Breeds in Zetland.

Length 25, breadth 55 to 58 inches; weight 54 ounces. Bill 2¼ inches long, brownish-black. The upper mandible is rounded along the margin towards the base, a little prominent in front of the nostrils above, and bent downwards at the end like the hawks. The under mandible is bent inwards at the edges; at the apex it forms a gutter, sloping downwards; at the base it is grooved laterally; and at the junction of the two sides, beneath, there is an angular prominence. The eyes are surrounded with a narrow bare black orbit, and the irides are hazel brown. The legs are covered with large black scales. The claws sre strong, of a black colour, arched and grooved beneath. The plumage, on the upper parts, is dark rusty brown, with yellowish-white oblong dusky spots. Each feather is dusky-brown on the edges, and yellowish-white at the end near the shaft. The plumage, below, is lighter coloured, and on the belly it is tinged with ash-grey. The feathers on the neck are wiry and pointed, and have a narrow oil-green spot on the extremity. The wings reach to the point of the tail. The shafts of the quills are white. The outer web, and the extremity of the first, deep brown; the tips only of the rest, brown; the remaining part, towards the base, is white. The covers of a few of the secondaries are white. The tail-feathers, which are twelve in number, are blunt; the shafts, and the webs at the base, are white; towards the extremity the webs are brown. There is no difference between the sexes, either in colour or size, in those which we have examined. It does not appear to be subject to much variation of plumage with age or seasons. Some individuals have been found having the chin and forehead tinged with ash-colour.—The common Skua is gregarious during the breeding season. It lays two eggs of a muddy green colour, marked with irregular brown spots, and intermixed with smaller white spots.—The nest is carelessly constructed of a few dried weeds, and is found in unfrequented moors. It breeds in the Zetland islands, where I have observed it, as in Foulah and Unst, and on Rona's Hill in Mainland. When the purposes of incubation have been accomplished, it retires from its summer haunts, and leads a solitary life on the ocean. It is found in our seas at all seasons. It is rare in the southern parts of the kingdom; and even about the Zetland islands it is by no means a common bird.

222. C. *parasiticus.* Arctic Skua.—Plumage above black; the two middle tail-feathers produced.

Larus par., *Linn.* Syst. i. 226. *Penn.* Brit. Zool. ii. 533.—Lestris par., *Temm.* Orn. ii. 796.—*E*, Teazer, Dung-hunter, Dung-bird, Scull, Boatswain; *S*, Faskidar, Badock, Allan, Scouti-allan, Dirten-allan; *N*, Shui. —Common on all parts of the coast. Breeds in the Hebrides and Northern Isles.

Length 21, breadth 43 inches; weight 16 ounces. The bill is 2 inches in length, of a greyish-black colour, darkest towards the point. The upper mandible is rounded along the margin towards the base, a little prominent in front of the nostrils above, and bent downwards at the end. The under mandible is bent inwards at the edges, and at the apex forms a groove sloping downwards; at the base it is grooved laterally; and, at the junction of the two sides beneath, there is an angular prominence. The eyes are surrounded with a narrow black orbit, and the irides are of a hazel-brown colour. The legs are of a black colour, rather slender. The claw of the outer toe is short; that of the middle-toe broad and grooved below; and of the inner toe narrow and arched. The tongue is fleshy and bluntly bifid. The middle of the palate, and a ridge on each side, are covered with cartilaginous reflecting teeth. The trachea at the division of the bronchiæ is furnished with a small bony plate. Rectum with too long broad vermiform appendages. Crown, nape, back, quills, tail and its under covers, brownish-black, deepest on the head and extremities of the wings and tail. Front, chin, cheeks below the eye, side of the neck, and below white. An indistinct collar of wiry-feathers round the neck. The wings reach beyond the lateral feathers of the tail; the first quill the longest. Tail of 12 feathers; the five exterior ones rounded, the extremity of the shaft projecting; the two middle produced feathers taper to a point. *Female* similar. —Nest in heath, of dry grass. Eggs 2, dark olive-green, with irregular blotches of liver brown. The *young* have the head and hind neck grey, with brown streaks; the back dusky-brown, the feathers with pale edges; below blackish-grey, with a ferruginous tinge; the base and tips of the quill and tail-feathers whitish. In its young state, and as it approaches to maturity, it is the (Larus crepidatus) Cepphus of Lyson, Phil. Trans. xlii. 137., and the Black Toed-Gull of Pennant, Brit. Zool. ii. 532.—The " Arctic Bird" of Edwards, tab. 148., frequently referred to as belonging to this species, appears to be distinct, as indicated by the bright yellow colour of the legs.—Like the preceding species, the Arctic Skua is subgregarious only in the breeding season, and remarkably bold in defending its nest. It has recourse to stratagem to lead intruders from its eggs or young, tumbling over, as if dying, or feigning a broken wing. It is worthy of remark, that this species breeds before it attains the plumage of maturity.

GEN. CI. LARUS. GULL.—Bill hooked; tail even.—The Females are similar to the Males in plumage, but less in size. Those which have white heads in summer, have those parts slightly streaked with dusky in winter. Those which have black heads in summer have white heads in winter. The Young are two or three years in reaching maturity

1. *Larger gulls; exceeding 20 inches in length.*

* *Quills white.*

223. L. *glaucus.* Burgomaster.—Length 30, breadth 63, of the tarsus $2\frac{9}{10}$th inches.

Fab. Faun. Groen. 100.—*Sabine,* Linn. Trans. xii. 543.—New species of Larus, *Edmonston,* Wern. Mem. iv. 176. *Scor.* Arct. Reg. i. 535.—*Temm.* Orn. ii. 757.—A winter visitant.

Bill 3 inches long, horn coloured, the symphysis of the lower mandible bright reddish orange. Irides and orbits yellow. Legs livid flesh-coloured. Plumage white; the back, scapulars, and wing-covers ash-grey. In winter, the neck is mottled with brown. *Female* less.—Nest among grass on the shore. Eggs 3, pale, with brown spots. *Young,* mottled, uniformly light brown and white; the whole bill lead-coloured. This species is rapacious, yet shy. It was first ascertained as a winter visitant of Zetland, by Laurence Edmonston, Esq. surgeon, Unst, in 1814.—It has since been detected on various parts of the coast, but it retires to the Arctic Regions during the breeding season.

224. L. *islandicus.* Iceland Gull.—Length 24, breadth 53, tarsus $2\frac{1}{2}$ inches.

L. argentatus, an arctic var., *Sabine,* Linn. Trans. xii. 546.—*Temm.* Orn. ii. 764. L. Isl. *Edmonston,* Wern. Mem. iv. 506.—A winter visitant of Zetland.

Bill about $2\frac{1}{2}$ inches long; rather slender. Plumage similar to the preceding. The wings, however, in this species, reach a little beyond the tail; while, in the glaucus, they only reach to the end of it. The *young* are distinguished from those of the preceding, by their dimensions, size of the bill, and paler plumage. Captain Sabine and M. Temminck agree in considering this species as the L. *argentatus,* deprived of the black markings on the quill-feathers, by its residence in an arctic climate. The absence of any direct proof, or even analogy, induced me, six years ago, to reject this conclusion as unwarrantable (Edin. Phil. Journ. vol. ii. 274); nor have subsequent proofs, of any value, been brought forward. Captain Sabine, it is true, states a fact (App. Parry's first voy., cciv.) which he considers as confirming Mr Temminck's decision; though, in reality, it only proves the occurrence of the Herring-Gull on the same cliff with the Islandicus:—"Amongst a number of the Greenland variety, which had their nests on a cliff on one of the Georgian Islands, one individual was observed to have black markings on the wings, and was fortunately secured. On comparing this specimen with birds which have been killed on our own coasts, the black markings of the quill-feathers are found to correspond precisely in shape and situation; the only perceptible difference being, that the dark colour is not quite so deep in shade in the Polar as in the European varieties." Mr Edmonston first recognized this species as a winter visitant of Unst, the most northerly of the Zetland Isles. It is there confounded, by the natives, with the Burgomaster, under the name of Iceland Gull, or Iceland Scorie, though Mr Edmonston notices its greater elegance and delicacy of form and its livelier and more active habits.

** *Quills black and white.*

225. L. *marinus.* Black-backed Gull.—Length 30, breadth 70 inches; tarsus flesh coloured, $2\frac{9}{10}$th inches; on the symphysis of the lower jaw a red spot with a dark centre.

> L. maximus, *Will.* Orn. 261. *Sibb.* Scot. 20.—L. mar. *Linn.* Syst. i. 225. *Penn.* Brit. Zool. ii. 528. *Temm.* Orn. ii. 760.—*E*, Cobb; *S*, Gull Maw; *W*, Gwylangefn ddie; *N.* Swabie, Bawgie, Swarthback.—Resident.

Bill 4 inches long, light yellow. Irides and orbits yellow. Head, neck, rump, tail, and below white: back and wing-covers bluish-black. Quills black, tipped and barred with white. *Female* similar.—Nest on inaccessible cliffs and islands. Eggs olive-green, with dusky blotches. *Young* mottled brown and white.—This species is fond of carrion, and will even venture to destroy weak lambs. Generally solitary or in pairs.

226. L. *fuscus.* Yellow-legged Gull.—Length 24, breadth 54 inches; tarsus yellow, $2\frac{2}{10}$th inches long. Orange spot of the symphysis destitute of the dark centre.

> *Linn.* Syst. i. 225.—Var. of L. mar., *Penn.* Brit. Zool. ii. 529.—L. argentatus, or Lesser Black-backed Gull, *Mont.* Orn. Dict.—L. fuscus, *Temm.* Orn. ii. 767.—Resident.

Weight $2\frac{1}{4}$ pounds. Bill, legs, and irides yellow; orbits red. Head, neck, rump, tail and below white; back and wings bluish-black; quills black, the point of the first white, with a black tip; the second similar, with only a white spot in the black; the others are very slightly tipped with white; two or three of the scapulars are also tipped with white. The wing exceeds the tail by 2 inches. *Female* similar.—Nest on islands, gregarious. Eggs 2, olive-brown, with dusky blotches.—*Young* mottled brown and white.—This species was first noticed as British by Pennant, who was uncertain whether it was a variety of *marinus*, or a distinct species. Montagu first illustrated its characters with precision.

227. L. *argentatus.* Herring-Gull.—Length 24, breadth 56, tarsus flesh-coloured, $2\frac{1}{2}$ inches. Bill yellow; orange spot on the symphysis destitute of the dark centre.

> Herring-Gull, *Penn.* Brit. Zool. ii. 535.—L. ar. *Temm.* Orn. ii. 764.—Resident.

Weight about 2 pounds. Irides yellow; orbits red. Head, neck, rump, tail and below white; back and wings bluish-grey; quills dusky, black towards the ends, with a white spot. Wings a little longer than the tail. *Female* similar.—Nest on islands. Eggs 2, olive-brown, with dusky blotches. *Young* mottled brown and white. In this state it has been termed Wagel.—This species has frequently been confounded with the preceding. This seems to be the case in the Larus cinereus maximus, *Will.* Orn. 262. I have found in the stomach of this species a considerable quantity of wheat.

2. *Smaller Gulls, less than 20 inches in length.*

228. L. *canus.* Common Gull.—Length of the tarsus 2 inches. Wings longer than the tail; the two outer quills with black shafts.

> L. cinereus minor, *Will.* Orn. 262. *Sibb.* Scot. 20.—L. canus, *Linn.* Syst. i. 224.—*Penn.* Brit. Zool. ii. 538. *Temm.* Orn. ii. 771.—Resident, common.

Length 17, breadth 36 inches; weight 15 ounces. Bill yellow, dusky towards the base, 2½ inches long. Mouth orange. Legs dull white. Irides and orbits brown. Head, neck, rump, tail and below white. Back and wings bluish-grey. Primaries black, the two or three first with a spot of white across the ends, and the tips black, the rest tipped with white; secondaries grey, tipped with white. *Female* similar.—Nest on ledges of rock on the coast, of sea-weeds. Eggs 2 or 3, dull olive-brown, blotched with dusky. *Young* mottled brown and white; the tail with a brown bar near the end. The white commences in the second year; the spots on the wings, and the dark bar of the tail finally disappear. In its young state it has been called the Winter Gull.

229. L. *Rissa.* Kittiwake.—Tarsus $1\frac{4}{10}$th inch. A small knob instead of a hind toe.

L. cinereus Bellonii, *Will.* Orn. 263.—Avis Kittiwake, *Sibb.* Scot. 20.—L. Rissa, *Linn.* Syst. 224. *Penn.* Brit. Zool. ii. 539.—L. tridactylus, *Temm*, Orn. ii. 774.—*E*, Annet.—Resident.

Length 14, breadth 38 inches; weight 8 ounces. Bill 2¼ inches long, slightly hooked, greenish-yellow; corners of the mouth, inside and orbits, orange. Feet dusky black. Irides chesnut. Head, neck, rump, tail, and below white; back and wing-covers pale grey. The four first quill-feathers are tipped with black, but the fourth has a small white spot near the point; the fifth (or sixth) is tipped with white, with a black bar. In moulting, I have observed that it is the sixth quill that is first cast off, then the fifth. *Female* similar.—Nest, in company, on ledges of rocks impending the sea. Eggs 2, pale olive, with dark markings. *Young* have the bill black. Head, neck, and below whitish; a black spot on the lores, and (lighter coloured) on the ear and on the nape. Above, the plumage is mottled grey and brown; the quills black; the tail dusky at the ends; the whole of the outer one, on each side, plain. The spot on the ear is the last marking of youth which disappears. In this young state, it is the L. tridactylus of Linnæus, and the Tarrock of Pennant. Mr Edmonston refers to a bird, nearly resembling the tarrock, which he has observed in Zetland, and which he is disposed to consider as a distinct species, under the title of *L. corvus.* "The upper part of the neck and head is pale blue; behind each ear, a spot of a darker shade of the same colour; the plumage otherwise, similar to that of the kittiwake."—(Edin. Phil. Journ. vol. viii. 99.) From its not breeding, nor frequenting the breeding-places of the common species, it is termed in Zetland, *Yeld Kittiwake.* It is also called *Craa Maa.* It is probably only the tarrock in the last stage of immaturity.

230. L. *ridibundus.* Black-headed Gull.—Head and upper-neck brownish-black; a large white space on the middle of the first quills; tarsus $1\frac{9}{10}$th inch in length.

L. cinereus, *Will.* Orn. 264.—L. rid. *Linn.* Syst. 225. *Penn.* Brit. Zool. ii. 541. *Mont.* Linn. Trans. vii. 284. *Temm.* Orn. ii. 780.—*E*, Pewit. Black-cap, Sea-crow, Rickmire; *S*, Hooded Maw.

Length 15, breadth 37 inches; weight 10 ounces. Bill and feet rich vermilion. Irides hazel. Round the eyes a few white feathers. Lower part of the neck, tail, and below white; the back and wings grey. Primaries white, the first with the exterior margin black; the second tipped with black, and marked with a black spot on the inner web. In winter the head is white, with a black patch on the ear, and another in front of the eyes; under the wing blackish-grey. *Female* similar.—Nest in meadows and islands in fresh water lakes. Eggs 3, olive, with dusky blotches. The *young* mottled with brown and white. The head then becomes white, with an obscure spot behind the ear; tail with a dark band. Base of the bill livid, the point black; the feet yellow. In these different states of plumage, it has been termed Red-legged Gull and Brown-headed Gull.—This species leaves Scotland in winter, but remains at that season on the English shores.

231. L. *capistratus*.—Head and throat brown: outer quills with white shafts: tarsus $1\frac{6}{10}$th inch.

Temm. Orn. ii. 785.

Length $13\frac{4}{10}$ inches. Bill and feet reddish-brown; the former slender. The front brownish-grey; the nape and fore-neck white. In other respects, and in its winter dress, it is like the black-headed gull. It differs, however, in its diminutive proportions, in the brown tints of the bill and legs; in the hood not descending to the nape, nor down the upper part of the fore-neck, and in the clear grey of the inner side of the wings. M. Temminck has separated this gull from the preceding, with which it appears to have been hitherto confounded by British naturalists. He states, that it is common in Orkney, and on the coast of Scotland and England; but it does not appear to have occurred to any of our native ornithologists.

STRAGGLERS.

1. *L. atricilla.* Laughing Gull.—*Mont.* Orn. Dict.—The author just quoted states, that "This species is larger than the black-headed gull; length 18 inches. It differs from that bird only in the legs, which are black; the bill is, however, stronger, and the head larger." Five birds of this species were observed by Montagu in August 1774, in a pool upon the Shingly Flats, near Winchelsea; and two others near Hastings, in Sussex.

2. *L. minutus.* Little Gull.—*Temm.* Orn. ii. 787.—This species has the shafts of the quills brown, the ends of the feathers white, and the tarsus only 1 inch and 1 line in length. Its diminutive size, (not exceeding 10 inches in length), serves to distinguish it from all the other species of this genus. Montagu first described this gull, accompanied by a figure, in the Supp. to the Orn. Dict., from a specimen shot on the Thames near Chelsea, in the collection of Mr Plasted.—Mr Neill received another specimen, shot in autumn 1824, on the shore of the Solway Frith, which he presented to the Ediuburgh Museum.

3. *L. candidus.* Snow-Bird.—*Fab.* Fauna. gr. 103.—L. eburneus, *Temm.* Orn. ii. 769.—The black feet, contrasted with the white plumage, distinguish this species. A solitary individual was killed in Balta Sound, Zetland, 13th December 1822. A description of its appearance was transmitted to the Wernerian Society (Wern. Mem. iv. 501.), by Mr Edmonston, whose zeal and success in illustrating the habits of the Zetland birds merit the highest praise.

Gen. CII. STERNA. Tern.—Bill pointed, with the mandibles equal; tarsi short. Tail forked.—The sexes are alike in plumage; but the male is superior in size. All the species leave the country during winter.

232. S. *Boysii.* Sandwich Tern.—Tarsus $1\frac{1}{2}$ inch. Bill 2 inches, black, with a yellow tip. Wings reach beyond the tail. Feet black.

Sandwich T., *Mont.* Supp. Orn. Dict. *Bewick's* Brit. Birds, ii. 204.—S. cantiaca, *Temm.* Orn. ii. 735.—On the English coast.

Length 18, breadth 33 inches. Irides dusky. Front, crown, including the eyes and nape, black. Neck, breast, rump, and belly, white, the two first with a reddish tinge; back and wing-covers grey. Primaries "hoary black on the outer webs, and more than half of the inner, near the shafts from the points, but gradually becoming less towards the base, the shafts and interior margins quite to the tip white."—(Mont.) In winter the black on the head disappears, or becomes mottled with white. Eggs 2 or 3, white, with black marks.—*Young* have the black and white mottled head tinged with red, and the grey on the back with the same; wing-feathers dusky; tail grey at the base, then dusky, with a white tip.—This species seems to breed in the Fern Islands on the coast of Northumberland, according to the notices given by Bewick.—It was first detected as a distinct species by Mr Boys of Sandwich.

233. S. *Anglica.* Gull-billed Tern.—Tarsus 2 inches long, Bill 1½ inch, wholly black. Wings 3 inches longer than the tail. Feet black.

Mont. Supp. Orn. Dict. *Temm.* Orn. ii. 744.—In England.

Dimensions nearly as the preceding. Bill prominent at the symphysis, as in the gulls. Front, crown, taking in the eyes, nape, and upper hind-neck black, the feathers long. Below white. Back, wings, and tail dark grey; the outer feathers only of the last white; the five first quills tipped with black. In winter the head is white with black marks before and behind the eye.—This species was first detected by Montagu.—It has since been observed in eastern Europe and the United States.

234. S. *Dougallii.* Roseate Tern.—Tarsus 1 inch. Bill 1⅝ inch, yellow at the base, black at the tip. Wings 2 inches shorter than the tail. Feet orange.

Mont. Supp. Orn. Dict. *Temm.* Orn. ii. 738.—Breeds on the Cumbray Islands in the Frith of Clyde.

Length 15½ inches. Irides black; the front, crown, including the eyes and nape, black. A streak above at the base of the upper mandible, cheeks, below the eye, neck, breast, and belly, white, the three last with a rosy blush; above grey. "Quill-feathers narrow, the first has the exterior web black, with a hoary tinge; the others are hoary on that part; and a portion of the inner web next to the shaft of the first three or four, is hoary black, becoming by degrees paler in the succeeding feathers, all deeply margined with white quite to the tip, and the shafts of all are white."—(Mont.) Tail white.—This species was first noticed by Dr Macdougall of Glasgow, who communicated the discovery to Montagu.—Temminck states, that it has been found on the coast of Norway, and in the Baltic.

235. S. *Hirundo.* Common Tern.—Tarsus 1 inch. Bill 1⅝ inch, crimson, tip dark. Wings about the same length as the tail. Feet orange. Side-feathers of the tail dusky.

Hirundo marina, *Will.* Orn. 268. *Sibb.* Scot. 21.—S. Hir. *Linn.* Syst. i. 217. *Penn.* Brit. Zool. ii. 545.—*E*, Sea-Swallow, Gull-tearer, Spurre, Seraye; *S*, Picktarny, Tirrock, Rippock; *W*, Y for Wennol fwyaf, Yscraean.—Common.

Length from 14 to 15⅜; breadth from 28½ to 30 inches. Bill, from the point to the feathers, in front, from 1⅛ to 1⅜. Gape from 1⅝ to 2 inches. Tip of the bill varying from pale red to brownish-black. Tarsus from $\frac{6}{8}$th to 1 inch in length. Front, crown, including the upper half of the orbit, and half way down the neck behind, black, in some the front is slightly freckled. From the nostril along the cheek, over the ears, throat, neck, breast, and belly, white, the breast with a rosy tinge, and the throat more or less grey. Above light grey, the rump white. Shafts of the quills white. Outer web of the first black towards the base, dusky at the tip, the inner web dusky at the shaft; the next five feathers dusky; the inner webs white at the base and along the margin. Middle tail-feathers white, the two or three exterior ones dusky on the outer web.—Nest on rocks or gravel. Eggs 2, olive-brown, with dusky blotches. *Young* at first brownish-black, mottled with black above, below whitish, the chin dusky; feet and bill pale reddish-white. In the same nest I have seen one of the young with the tip of the bill plain, and the tip of the bill of the other dusky, as I have witnessed likewise in the old birds.

The *Sterna Arctica* of Temminck (Orn. ii. 742., and *Sabine*, App. Parry's First Voyage, ccii.), which he states as occurring on the coasts of this country, is, in my opinion, only a variety of the common tern. It differs chiefly in the point of the bill not being black, and in the tarsus being 4 lines shorter. Having examined many individuals of the *S. hirundo*, in reference to all their external markings (and at the same time), I am satisfied that these distinguishing characters have too extensive a range of variation to warrant the establishment of this species.

236. L. *nigra*. Black Tern.—Webs of the toes much indented. Tarsus $\frac{8}{10}$th of an inch. Bill black.

L. niger, and fissipes, *Will.* Orn. 269–70.—L. fissipes, *Linn.* Syst. i. 228. *Penn.* Brit. Zool. ii. 547.—L. nigra, *Temm.* Orn. ii. 749.—*E*, Scare-crow.—Breeds in the fens of England.

Length 10, breadth 24 inches; weight 2½ ounces. Legs dusky red. Irides brown. Crown, head, neck, breast, and belly, greyish-black. A white spot under the chin. Back, wings, and tail, deep ash, the outer feathers on each side of the last white. In winter, the front, lores, throat, fore-neck, and belly, are white. The *female* wants the spot on the throat.—Nest in sedgy places, on the margin of pools. Eggs 3, olive-brown, blotched with brown and black.—*Young* in the winter dress; the back and scapulars brown, with light edges.

237. S. *minuta*. Lesser Tern.—Bill black, the base and feet orange. Tarsus $\frac{7}{8}$ths of an inch. Front white.

L. piscator, *Will.* Orn. 269.—Sterna minuta, *Linn.* Syst. i. 228. *Penn.* Brit. Zool. ii. 546. *Temm.* Orn. ii. 752.—*E*, Richel Bird.—Inhabits England along with the Common Tern.

Length 8½, breadth 19½ inches; weight 2 ounces and 5 grains. Irides dusky. Front, and a streak below the eye, white. Lores, crown, nape, and hind-neck, black; back and wings bluish-grey; rump, tail, and below, white. Shafts of the quills brown. Nest among shingle. Eggs 2, pale brown, spotted with cinereous, and dusky. *Young*, with the front yellowish-white, head brown, back and wings yellowish-brown.

EXTINCT SPECIES.

Birds seem to have experienced fewer revolutions in genera and species during the different epochs of the Earth's history, than either quadrupeds or reptiles. The extinct species are few in number, and hitherto their characters have not been sufficiently illustrated. In the calcareous slate of Stonesfield, the leg and thigh bones of birds have been detected, apparently belonging to a wader.—Geol. Eng. and Wales, 208.

In the preceding observations on the characters and habits of our native birds, I have frequently referred to summer and winter visitants, to polar and equatorial migrations, and to stragglers. The reader who wishes to investigate the laws regulating the distribution and migration of birds, with which the above mentioned terms are connected, may consult my "Philosophy of Zoology," vol. ii. chap. 2. It may be proper, however, to bear in mind that birds, in reference to these islands, may be contemplated under the following divisions.

1. *Birds*, which are permanently resident, and able to remain in their ordinary stations, independent of the changes of the seasons,—such as the Common Partridge, Blackbird, and Sparrow.

2. *Summer Visitants.*—Birds of this class arrive in spring, and depart in autumn. During their residence amongst us, they pair, build their nests, and bring forth their young. They retire to spend the winter in regions nearer the Equator,—such as the Swallow, Turtle Dove, Nightingale, and Corncrake.

3. *Winter Visitants.*—These come to us in autumn, and depart in spring. Their breeding-places are in regions nearer the pole,—such as the Snow-Bunting, Wood-Cock, and Wild-Goose.

4. *Stragglers.*—Under this division species are included, individuals of which have occurred in this country at distant and uncertain intervals. They usually appear after boisterous weather, and seem, in such circumstances, to have been driven from their ordinary haunts, or course of migration, by the fury of the wind. Many birds belonging to the Continent of Europe, have, in this manner, made their appearance amongst us, and have been inconsiderately ranked as native birds by systematical writers,—such as the Bee-eater, the Great Black Woodpecker, and Nutcracker, and a host of other species. North America has furnished a few species under similar circumstances, such as the *Falco furcatus*, and the White-winged Grossbill. To this division I have to add the occurrence of a single individual, of a species hitherto unknown, even as a straggler, to European ornithologists, and which I have received since the preceding sheets had passed through the press; *the Passenger Pigeon*, Columba migratoria, *Wilson's American Ornithology*, vol. v. p. 102. tab. xliv. fig. 1. It was shot, while perched on a wall in the neighbourhood of a pigeon-house at Westhall, in the parish of Monymeal[*], Fifeshire, 31st

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[*] Length from tip of the bill to the oil-bag $8\frac{8}{10}$th inches; to the end of the tail 8 = $16\frac{8}{10}$th inches. Breadth 24½ inches; weight 9 ounces. Bill an inch, black, lengthened, slender; nasal scale wrinkled; a slight flexure in the line of the gape, immediately under the nostrils. Upper mandible longer than the under, and bent downwards, with the rudiments of a notch; symphysis of the lower mandible short, subascending, slightly prominent retrally, with a shallow mesial groove; inside of the mouth livid. Tongue blunt. Bare pace round the eyes, livid. Irides reddish-orange. Feet reddish, paler behind than before. Tarsus $1\frac{1}{10}$th; the middle toe, exclusive of the nail, the same. Claws black, arched and grooved below. Chin, cheeks, head, back, and rump, bluish-grey; shoulders with a tinge of yellowish-brown. Side of the neck, and behind, rich reddish-purple, iridescent. Fore-neck deep chesnut, becoming paler on the breast, or rather salmon-coloured, and passing to white on the belly and vent. Thighs like the breast. Quills brownish-black, the grey colour of the margin of the outer web increasing at the base of the secondaries, and towards the ends of the inner ones. Bastard wing and greater covers of the primaries brownish-black; greater covers of the secondaries grey. Lesser covers and outer scapulars tinged with yellowish-brown, with black spots. The second quill the longest, the first and fourth equal, but these not at full growth. Tail of 12 feathers, the two middle produced, the

December 1825. The feathers were quite fresh and entire, like those of a wild bird. I owe the possession of the specimen to the ornithological zeal and attention of the Reverend A. Esplin, schoolmaster of Monymeal.

A second class of stragglers includes those species, individuals of which have escaped from confinement on board of vessels, or from aviaries on shore, —such as the Painted Bunting, the Trumpeter, and the Black Swan. Such birds, if carefully examined, will be found to have the extremities of the wing and tail-feathers worn and imperfect, the result of their confinement.

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The reader who wishes to examine figures of the British Birds, may consult with great advantage the expressive delineations of Bewick, whose work on " British Birds" he will find a useful companion to his studies. Should coloured figures, as elegant productions of art and luxury, be the object of his wishes, he will find gratification in the publications of Edwards, Pennant, Donovan, and Lewin, but especially in the splendid work of Mr Selby, which is superior to all the others, in true form, correct expression, and faithful colouring.

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rest decreasing to the exterior. The two middle dusky black, the next grey, the inner margin white towards the extremity, with a black and brown spot near the base ; the fourth and third grey, with the black spot ; the second grey, with the black and brown spot. The outer web and tip of the first white, lower half of the inner web grey, with a black and brown spot. The upper tail-covers long, produced ; the lower ones white.

Class III. REPTILES.

Class III. REPTILES.

I. *Heart with two auricles.*

- A. Body furnished with feet.
  - I. Body protected by a corneous shield. CHELONIA.
    - Chelona.
    - Coriudo.
  - II. Body covered with scales. SAURIA.
    - Lacerta.
- B. Body destitute of feet. OPHIDIA.
  - I. Ventral and dorsal scales similar.
    - Anguis.
  - II. Ventral and dorsal scales dissimilar.
    - Natrix.
    - Vipera.

II. *Heart with one auricle.* BATRACHIA.

- A. Furnished with a tail.
  - Triton.
- Destitute of a tail.
  - Rana.
  - Bufo.

CHELONIA.

* STRAGGLERS.

GENUS **CHELONA.** — Lips corneous. Breast-plate interrupted by intervening cartilaginous spaces. Back-plate covered with corneous scales.

1. Ch. *imbricata*. Hawks-bill Tortoise. — Two claws on each hind-foot. Back-plate heart-shaped, the scales imbricated.

Testudo marina, *Sibb.* Scot. 13.—T. caretta, *Ray*, Syn. Quad. 258.—T. imbricata, *Linn.* Syst. i. 350. *Lacepede*, Ovip. Quad. (Trans. by Kerr, Edin. 1802.), i. 138. *Turton's* Brit. Fauna, 78.—A rare visitant.

This species, common in the American seas, can be viewed only as an accidental straggler, when appearing on our coasts. Sibbald, in his Prodromus, first noticed the occurrence; afterwards in his Auctarium Musæi Balfouriani, p. 193., he adds, " TESTUDO MARINA SQUAMOSA. The Scalie *Sea-Tortoise*; the shell of it. The ANIMAL came in to ORKNEY, and this was sent to me from thence." Low does not mention this notice of Sibbald, and appears not to have been aware even of the occasional visits of this animal to the coast. I have credible testimony of its having been taken at Papa Stour, one of the west Zetland Islands.

Dr Turton has recorded one instance of an individual, which, " in the spring of 1774, was taken in the Severn, and placed in the fish-ponds of the author's father, where it lived till winter."

GENUS **CORIUDO.**—Back-plate coriaceous, ridged, and destitute of scales.

1. C. *coriacea*. Leathern Tortoise.—Breast-plate imperfect. Back-plate pointed behind, with five longitudinal ridges.

T. cor. *Borlase*, Corn. 285. tab. xxvii. f. 4. *Linn.* Syst. i. 350. *Penn.* Brit. Zool. iii. 7. *Lac.* Ov. Quad. i. 146.—South coast of England.

Two instances of the occurrence of this species, on the coast of Cornwall, in July 1756, are mentioned by Borlase.

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The geographical limits of marine animals are too imperfectly known, to enable the naturalist to determine the true character of those occasional visitants. Uncommonly warm seasons, the more or less abundant supply of food, or the prevalence of storms, may bring to our shores the tortoises and other animals of more southern seas, without enabling us to claim them as natives. The tortoises do not lay their eggs in such high latitudes, nor is it probable, that, unless by accident, they would ever visit us. They can execute extensive migrations, and practise abstinence, otherwise, instead of occurring in a live state, they would be cast up a putrid mass on the shores. Examples may occur likewise, of such as may have escaped from wrecked vessels. Taking these circumstances in connection, it is probable that the *Ch. caouna*, or Logger-headed Tortoise, common in the Mediterranean, and the

Ch. Mydas or Green Tortoise, may, like the two species noticed above, be yet enumerated among our accidental visitants. Neither is it improbable that the relics of the Mud Tortoise and Round Tortoise, both European species, may occur in some of the older members of the "modern strata" in the southern parts of the island.

** EXTINCT SPECIES.

The tortoises of this division appear, from the relics of marine animals, with which they are associated in the different strata, to have been inhabitants of the sea. Baron Cuvier, however, ranks two of our extinct species in his section, "Des Emydes ou Tortues d'eau douce." It is probable that the relics, from the following localities, belong to different species, though the distinguishing characters of these may not, as yet, be sufficiently determined.

1. The strata in the Isle of Sheppey (Geol. Trans. ii. 205.), regarded as analogous to the "London clay," contain the remains of a tortoise, which Cuvier considers as approaching, in some of its characters, to his Emys expansa, (Recherches sur les Ossemens Fossiles, v. p. 2, 234. tab. xv. f. 12.) He is disposed to refer to this extinct species of Sheppey the one noticed by Mr Parkinson, Org. Rem. iii. tab. xviii. f. 2. This last author delineates the head of another tortoise from the same place, ib. f. 3.; concerning the relations of which Baron Cuvier offers no remark.

2. A species of tortoise was found by Mr Mantell in the iron sand-beds of Tilgate Forest (Emydis des sable ferrugineux du Comté de Sussex, Rech. Os. Foss. v. 2. p. 232.) Baron Cuvier thinks that it bears a near resemblance to the remains of a species found by Professor Hugi of Soleure, in the Jura limestone, on the left bank of the Aar.

3. The argillaceous limestones, termed Purbeck beds, and which belong to the upper division of the oolitic series, furnish bones, and even nearly complete specimens of fossil turtles.—Geol. of England and Wales, p. 172.

4. In the Stonesfield slate, referred to the lower division of the Oolitic series, remains of two or three species of tortoises occur.—Geol. Eng. and Wales, p. 208.

5. The Lias has furnished bones and palates of a species of turtle.—Geol. Eng. and Wales, p. 267.

SAURIA.

Gen. I. LACERTA. Lizard.—Tongue bifid. Palate and jaws with teeth. Five toes, with nails on each foot.

1. L. *agilis*. Nimble Lizard.—Back with dark bands. Tail annulated with sharp scales.

L. flavi coloris, *Sibb.* Scot. 13.—L. vulgaris, *Ray*, Quad. 264.—L. agilis, *Linn.* Syst. i. 363.—Scaly Lizard, *Penn.* Brit. Zool. iii. 21.—*S*, Mankeeper; *G*, Dearc luachair.—In warm sandy situations.

Length about 6 inches. Head triangular, depressed, with large scales, one on each side, forming eye-brows. Snout rounded. Jaws equal, teeth recurved. Toes slender. A row of tubercles along the inside of each thigh. Throat with a double collar of large scales. The scales of the belly quadrangular, and placed in transverse bands. Tail twice the length of the body. Belly yellowish. Colours vary with the condition of the cuticle which is frequently renewed. Before casting, the colours are brownish black; after they change, dark green and yellow tints prevail. This species becomes torpid during winter, and pairs after reviviscence. Eggs placed at the bottom of a wall facing the south, where they are hatched by the heat of the sun. It is sometimes ovoviviparous. In 1803 I kept a female of this species for two months, until it died in September, after giving birth to four young ones, perfectly formed, and measuring an inch and a half in length. Food consists of worms and insects, which it never seizes but when by motion they exhibit signs of life. Easily tamed. Irritated when touched on the jaw or throat. Tail brittle, and frequently broken off, but readily reproduced.

Ray mentions the following varieties :

" 1. *Terrestris vulgaris ventre nigro maculato.* 2. *Terrestris anguiformis in ericetis.* 3. *Parvus terrestris fuscus opido rarus.* 4. *Lacertus terrestris luteus squamosus Anglicus*, Plot. Hist. Staff. 252. 5. *Lacertus aquaticus fuscus niger.*" The history of these varieties is still involved in obscurity.

Mr Sheppard, in the seventh volume of the Linn. Trans. p. 49., seems to have exalted the varieties of this animal into distinct species, chiefly from characters depending on the colours of its different parts. In so obscure a department of the British Fauna, it is possible that our opinion may not be well founded. The descriptions which he has given, here subjoined, will enable the student to decide for himself.

" 1. L. *agilis.* Scaly or Swift Lizard.—Head, upper part, light brown, with a few black spots. Back, ground colour light brown; a line of irregular black spots along the middle; next to this, a stripe, spotted alternately with black and white; then succeeds a broad dark brown one, with a line of black, and white spots in it: all these lines extend from the head to the end of the tail. Belly, in some, of a dull white; in others, a bright yellow. Tail, on the under part, dirty-white, beautifully mottled with black spots; the latter, however, in some specimens, are wanting. Legs, light brown above, spotted with white on the sides, and beneath of the same colour as the belly. Feet, both fore and hind, have five toes on each, furnished with nails. Length 6½ inches.

" 2. L. *œdura.* Swelled-tailed Lizard.—Head, upper part, dark brown, with a few black spots; under part, dull white, mottled with black. Back, on the middle, a black list, on each side of that a broad brown one, with a line of black spots in it; then a narrow stripe of alternate yellow and brown spots; beneath this, a broad, brownish-black stripe, with a line of yellow spots in it: these lines all end about half an inch beyond the hind legs. Sides finely mottled with black and white. Belly of a beautiful orange (in some yellow, in others dirty-white), spotted with black. Tail bulging out a little below the base (where the lines down the back terminate), which gives it the appearance of having been cut off and set on again: this is of a light ash-colour, with a few long black marks at the end, and a large red mark on the under part at the base; the latter, however, varies according to the colour of the belly. Legs light brown above, black and white on the sides, and beneath, red, yellow or dull white (according to the belly), variegated with black spots. Feet have all five toes, with nails. Length 4½ inches.—This species I have at different times found in vast abundance; yet, not having seen it described in any of the books I have access to, I have ventured to call it a new species, under the name, expressive of its conformation, of Œdura or Swelled-tail."

" 3. L. *anguiformis.* Viperine Lizard.—Head very light brown above, with four dark spots; yellowish-white beneath. Back, with a black line along the middle, reaching from the head to about half an inch beyond the hind legs; on each side of this, a broader one of dark brown (these, beyond the black line unite, and reach to the end of the tail); next to these, succeeds a fine yellow stripe, that extends to the end of the tail; then a black one, which reaches no farther than the middle line, and afterwards a dark brown stripe, mixed with a few yellow spots extending to the end of the tail. A little above the hind legs, in some specimens, is a slight division of the scales, forming a transverse line. Belly yellowish-white, with a few black spots. Tail, under part dirty white, spotted with black as far as within an inch of the end; the remainder marked lengthways with long bars of black. Legs dark brown, spotted with black. Feet have all five toes, with nails. Length 7 inches and upwards : I saw one specimen above a foot long, but was not able to catch it.—This lizard, which I think may, with propriety, be described under the name Anguiformis, I have once or twice found near marshes, but its general abode is upon heaths; this circumstance, together with its viperine appearance and colours, which have more than once deceived me in hastily passing it, induce me to suspect that it must be the L. *anguiformis* of Ray."

Ray takes notice of the L. *viridis*, or Green Lizard (Quad. 264.), as inhabiting Ireland. It occurs in Guernsey; and, according to Pennant, it has been propagated in England. The upper parts of the body being rich, variegated green, the belly whitish, and the length being from 18 to 30 inches, distinguish it from the L. *agilis.* Pennant mentions a lizard, probably of this species, " which was killed near Woscot, in the parish of Swinford, Worcestershire, in 1741, which was 2 feet 6 inches long, and 4 inches in girth. The fore-legs were placed 8 inches from the head; the hind-legs 5 inches beyond these; the legs two inches long; the feet divided into four toes, each furnished with a sharp claw. Another was killed at Penbury, in the same county. Whether these are not of exotic descent, and whether the breed continues, is what we are at present uninformed of."—Brit. Zool. iii. 22.

In the Statistical Account of Little Dunkeld by the Rev. John Robertson, vol. vi. p. 361. is the following note. " A quadruped found in the moors at the eastern extremity of the parish, is entitled to notice as a remarkable variety of the Lizard tribe. It is about 9 inches long, the body, or trunk, is of an unusual length in proportion to the tail, which does not taper gradually from the hind-feet, as in other lizards, but becomes suddenly small, like that of a mouse. The back is full of small protuberances, and guarded with a skin almost as hard as a sea-shell. The eyes large, clear, and circular, like those of an ordinary trout; the jaws more than an inch in length, and the teeth so strong as to be heard making a ringing noise upon the iron point of a pole at the distance of more than ten feet. It is believed in that part of the country, that, about 50 years ago, the bite of this animal proved fatal to a child two years old. It is never seen but upon very dry ground. When irritated it expresses its rage by the reddening and glistening of its eyes."

These notices, of imperfectly known species or varieties, may probably excite those who enjoy favourable opportunities to communicate more extended descriptions of their characters and distribution.

EXTINCT SAURIAN REPTILES.

1. CROCODILE.—The remains of several distinct species of animals belonging to this genus, occur in those strata which are placed above the independent coal formation. Of these the following may be noticed.

1. In the year 1791, M. G. A. Deluc communicated to Cuvier the calcaneum of a crocodile from Brentford. It was found associated with the remains of the extinct elephant, rhinoceros, &c. in the Lacustrine silt of that district, one of the members of the modern or superficial strata. Baron Cuvier seems to consider it as having belonged to a species distinct from the recent kinds. If it be also distinct from the other fossil species, and have not been washed out of its original repository in some older bed, it must be considered as the most recent of the extinct species.—Cuv. Rech. v. 2. p. 169.

2. In the clay of Sheppey, the jaw of a crocodile has been found, Webster, Geol. Trans. ii. 194. Cuv. Rech. v. 2. 165.—In the tabular view of the fossils of the London clay, in the Geology of England and Wales, it is stated, "That the remains of a crocodile very nearly approaching to the characters of existing species, and especially to the crocodile, *à museau aigu*, have recently been discovered in the London clay at Islington."

3. In the Geology of England and Wales, p. 172, it is said, "Mr Johnston of Bristol possesses a very perfect head of a crocodile, found in Purbeck; but the character of the matrix is not quite decisive, as to whether it belongs to these or to Portland beds."

4. Baron Cuvier, Rech. v. 2. 161, notices the occurrence of a crocodile in the iron sand of Tilgate Forest, Sussex, and refers to Mr Mantell's Fossils of the South Downs, p. 47.

5. In the Geology of England and Wales it is stated, that "A well characterised crocodile, but of a species distinct both from those now known to exist, from those found in a fossil state in Germany, and from one, at least, of the French fossil species, has been dug up at Gibraltar, near Oxford, and is now in the collection of that Univerisity; it is from a bed towards the upper part of this oolitic system, perhaps the Cornbrash," p. 208.

6. The alum-shale of Whitby, so fertile in organic remains, has furnished the skeleton of a crocodile, a figure of which has been published by the Rev. George Young, in the Edin. Phil. Journ. No. xxv. p. 76. tab. iii. In the length of the snout it approaches the Gavial. Mr Young is disposed to consider the skeleton found at Whitby in 1758, a drawing and description of which, by Mr Wooller, appeared in the Phil. Trans. l. p. 786. tab. xxx., as probably belonging to the same species.

II. MEGALOSAURUS.—This genus was instituted by Professor Buckland for the reception of the relics of an animal of great size, found in the calcareous slate of Stonesfield, near Woodstock, Oxford. It is of a mixed character, exhibiting resemblances both to the Monitors and the Crocodiles. A portion of the jaw, a femur, several vertebræ, and other bones of doubtful character, have been procured. The portion of the jaw is straight. The teeth are compressed, pointed, recurved, with the cutting edge crenulated. They do not adhere to the jaw, but they are protected externally by its elevated margin. Length probably approaching 40 feet.—Geol. Trans. 2d Series, 1. tab. xl.-xliv. Mr Mantill has found the remains of this animal (probably a different species) in the ironsand of Tilgate Forest.—Cuvier Rech. v. 2. 343.

III. IGUANODON.—This genus, was instituted by Mr Mantill, in a paper read before the Royal Society of London, February 10.

1825, for the reception of the bones of an animal found in the ironsand of Tilgate Forest, near Cuckfield, in Sussex. This reptile appears to have been herbivorous, and to possess a close affinity with the recent Iguana of the West Indies. Mr Mantill considers the animal as having been upwards of 60 feet in length.—Annals of Philosophy, March 1825, p. 223.

ENALIO SAURI.

In this group of Saurian Reptiles, instituted in a paper by H. T. de la Beche and the Rev. W. D. Conybeare, Geol. Trans. v. 559, the extremities are four in number, terminating in paddles, composed of a series of flat polygonal bones, constituting organs fit for swimming, but incapable of executing progressive motion on the land. The eyes are large, and the sclerotica is strengthened by a circle of osseous pieces;—a character which establishes an affinity with birds, lizards and tortoises, to the exclusion of crocodiles and fishes.

IV. Ichthyosaurus.—This genus, the characters of which have from time to time been developed by Sir E. Home, in the Philosophical Transactions of the Royal Society of London from 1814 to 1820 inclusive, and more recently by Mr Conybeare, exhibits the snout of a dolphin, the teeth of a crocodile, the head and sternum of a lizard, and the swimmers of a whale, with the vertebræ of a fish. The extremities have no distinct radius and ulna; but the humerus supports immediately a numerous series of polygonal bones. The anterior extremities are the largest. Dentition like the crocodile, the young tooth growing up in the interior of the cavity of the old one, and, when matured, splitting, and causing it to fall. Teeth numerous. Vertebræ from 80 to 90. The following species have been established.

1. I. *communis*.—Teeth with conical summits, moderately pointed, slightly bent and deeply striated. This is the largest of the species, and occurs in the Lias. It is probably the one figured by Mr Young, Wern. Mem. iii. p. 450. tab. xxii.

2. I. *Platyodon*.—Teeth with compressed summits, with a sharp ridge on each side.

3. I. *tenuirostris*.—Teeth slender; nose produced.—Home, Phil. Trans. 1819, tab. xv.

4. I. *intermedius*.—Teeth more pointed, and less deeply striated, than in I. *communis*.

These different species are distributed in the strata of the lias and oolitic formations. Dr Harlan has proposed to add another species to the British list, which he supposes to have come from the neighbourhood of Bath or Bristol. It resembles the I. communis; but he says that the teeth are more aduncate, and the dental bone of greater relative thickness. He proposes to term it I. *coniformis*.—Journ. Acad. Phil. iii. p. 336. tab. xii. f. 6, 7, 8.

V. Plesiosaurus. — This genus was instituted by Mr Conybeare. With the swimmers of a whale, and the head of a lizard, it possesses a neck resembling the body of a serpent. The teeth are unequal, slender, pointed, a little bent, and grooved longitudinally. Two species occur in the strata of Britain.

1. P. *dolichodeirus*.—This species is an inmate of the lias at Lyme.
2. *P. recentior*.—Found in the Kimmeridge clay.

Baron Cuvier considers the bone figured by Sir E. Home, Phil. Trans. 1818, tab. iii., as the humerus of a Plesiosaurus; different, however, from the preceding species, and more nearly related to P. pentagonus, or trigonus, two other species which he has instituted.—Rech. v. 2. 475.

OPHIDIA.

GEN. II. ANGUIS. BLIND-WORM.—A third eye-lid. Traces of scapular and clavicular bones. Tympanum concealed. No palatine teeth. Maxillary teeth compressed and recurved.

2. *A. fragilis*.—Common Blind-worm. Head covered with nine large scales; dorsal scales rounded and plain.

Typhlops, *Sibb.* Scot. 28.—Cæcilia, *Ray*, Syn. Quad. 289.—Anguis frag. *Linn.* Syst. i. 392. *Penn.* Brit. Zool. iii. 36. *Lacep.* Ov. Quad. iv. 293.—*E*, Slow-worm; *W*, Pwl dall, Needr y defaid.—Not uncommon.

Length about a foot (in this country, where its growth is much reduced by the cold), of which the tail forms one-half. Body greyish, with two dark-brown stripes along the back, and one on each side from the eye. The belly dark brown. Head small; neck slender; body larger, continuing nearly of equal thickness to the tail, the end of which is blunt. The scales on the head are placed in four rows; the first having only one scale, the second two scales, and the third and fourth have three each. The other scales on the lips and body are small, and nearly of the same size. Eyes small. Gape extending beyond the eyes. Tongue notched in a crescent form. Ovoviviparous. Lives in holes in woods, way-sides, or heaps of rubbish. Feeds on worms, frogs, and mice. Becomes torpid during the winter. Brittle. Its bite not venomous. Borlase, however, when speaking of the " *long cripple*," regarded by Pennant as the blind-worm, says that its bite is poisonous. He, however, adds, that it is of the " tail-pointed kind." As the obtuse tailed kind, the true blind worm, also inhabits Cornwall, it is probable that some of the varieties of the viper were referred to. The figure which Borlase gives of the " long cripple," (tab. xxviii. f. 24.) tapers too gradually to a point ever to have been copied from a blind-worm.

The *Anguis Eryx*, *Linn.* Syst. i. 392, or *Aberdeen Serpent* of *Penn.* Brit. Zool. iii. 35, appears to be no other than a variety of the *fragilis*, from which indeed it can scarcely be said to differ. It was communicated to Linnæus and Pennant by Dr David Skene of Aberdeen. In his MS. descriptions of animals (now before me), he notices it under the trivial name Anguis Scoticus. Two examples are recorded. The largest about 15 inches in length, of which the tail occupied 8¼ inches. In the smallest specimen, the scales on the belly were 124; of the tail 63; a part of the latter he conjectures may have been wanting. In the largest, the scales of the belly were 120; of the tail 137. Linnæus states the number 126,–136, while his numbers for fragilis are 135,–

135. On the character derived from the number of scales either of the belly or tail, no reliance can be placed; so variable are they on individuals of the same species.

GEN. III. NATRIX. SNAKE.—Destitute of poison-fangs. Four regular rows of imperforate teeth above, and two below.

3. *N. torquata.* Ringed Snake.—Head with nine large scales; dorsal scales oval, with a mesial ridge.

Hydrus, *Sibb.* Scot. 28.—Nat. torq. *Ray*, Syn. Quad. 334.—Coluber Natrix, *Linn.* Syst. i. 380. *Penn.* Brit. Zool. iii. 33.—Collared Viper, *Lac.* Ov. Quad. iii. 346.—*E*, Common Snake; *S*, Water Snake; *W*, Neidr fraith, Neidr y tome nydd.—Common in England; rare in Scotland.

Length from 3 to 4 feet. Back dusky-brown, with two black stripes of spots running the whole length, crossed by numerous irregular spots. Belly dusky, with a bluish tinge; a spot of yellow, and another triangular one of black on each side the neck. Head depressed; muzzle rounded; the large scales in four rows, the first and second of two each; the third of three, and the fourth of two; seventeen scales on each jaw. Scales of the sides small and smooth. Belly variegated black, white, and bluish; the plates of the belly about 120; pairs of the tail 53, or even 60. Eggs 18 to 20, deposited in dunghills or hot-beds. Feeds on ants, frogs, and mice. Becomes torpid during the winter. Easily tamed. Frequents marshy places, and enters the water occasionally.

4. *N. Dumfrisiensis.* Dumfries-shire Snake.—Dorsal scales destitute of a mesial crest.

Coluber Dum. *Sower.* Brit. Misc. tab. iii.

" *Plates on the belly*, 162. *Scales under the tail about* 80. This coluber seems to be entirely new, and was discovered by T. W. Simmons, near Dumfries. As only one specimen has been seen, we cannot say much with regard to its usual size. The figures are pretty accurately drawn, as to the size of the specimen (about 5 inches). The scales of the back are extremely simple, not carinated. It is of a pale colour, with pairs of reddish-brown stripes from side to side, over the back, somewhat zig-zag; with intervening spots on the side." This is all the information which has yet been acquired concerning this species. There is no mention made of the large scales on the head, though they are represented in the figure, and intimate that this cannot be the young of the common viper; while the smooth dorsal scales indicate that it is a distinct species from the ringed snake. In the last character, it agrees with the smooth viper, Col. Austriacus of Gmelin, a species common in Germany and France, of which it may probably be only a variety.

GEN. IV. VIPERA. VIPER.—Maxillary bones with poison-fangs, but no common teeth. Scales behind the vent divided. Neck narrow. Head destitute of plates.

5. *V. communis* Common Viper or Adder.—Dorsal scales oval, carinated; inferior lateral ones subangular and plain.

Anguis *Sibb.* Scot. 28.—Vipera, *Ray*, Syn. Quod. 285.—Col. Berus, *Linn.* Syst. i. 377. *Penn.* Brit. Zool. iii. 26.—*W*, Neidr, Neider du, Giviber; *G*, Nathair. In heaths.

Length from 2 to 3 feet. Colour dirty-yellow; a stripe, on each side, of black triangular spots, and a dorsal stripe of confluent rhomboidal spots. Space between the eyes and two spots on the crown, black. The head is broad behind; edges of the jaws covered with large scales. Belly dusky, tinged with blue. Scales on the belly 142 to 148; pairs on the tail 30 to 40. Ovoviviparous, producing from 12 to 25 young. Feeds on insects, frogs, and mice. Becomes torpid during the winter.—As this species is subject to considerable variety in its markings, depending upon age, sex, or season, it has been multiplied into the following species, which Dr Leach, in the third volume of his Zoological Miscellany has, with propriety, reduced to the rank of varieties.

1. *Black Viper*, Col. Prester, *Linn.* Syst. Nat. i. 377.—Colour nearly black. Lacepede says, Ov. Quad. iii. 247, that, " in this species, the top of the head is not entirely covered with scales, resembling those of the back, as in the common viper; but there are three scales, a little larger than these, placed between the eyes, one advanced towards the nose, and two immediately behind." This character, however, is possessed by the viper.

2. *Blue-bellied Viper*, *Rev. Revett Sheppard*, Linn. Trans. vii. p. 56. In this the back seems more tinged with brown, and the belly with blue, than usual.

3. *Red Viper*, *Rev. Thomas Rackett*, Linn. Trans. xii. 349.—This is supposed to be the Coluber chersea of Linnæus. It possessed the heart-shaped spot on the head, and the dark spot near the extremity of the tail. Above, a bright red colour. " I received the viper from the Reverend John Tregonwill Napier, Rector of Chettle, in Dorsetshire, who killed it in Cranborne Chace. It is extremely rare, but known to the game-keepers under the name of " *The Red Viper*," ib. 350. It has likewise been found by the Reverend Revett Sheppard, in the parish of Levington, and other places in the county of Suffolk, in arid waste situations."—Linn. Trans. xxii. 615.

BATRACHIA.

GEN. V. TRITON. EFT.—Feet four, supported by bones. Four toes on the fore-feet, five behind, without claws. Tail compressed.

The young are produced from eggs, laid on aquatic plants; breathe at first by gills; and have two claspers under the throat, by which they can adhere to a leaf. When the feet become perfect, the gills and claspers are absorbed.

6. *T. palustris.* Warty Eft.—Body covered with small warts; brownish-black above; orange, with black spots below.

Lacerta palustris, *Linn.* Syst. i. 370.—Warty Lizard, *Penn.* Brit. Zool. iii. 23. *Shepp.* Lin. Trans. vii. 52.—Inhabits ponds and marshes.

Length between 6 and 7 inches. Head depressed; snout blunt, finely freckled with yellowish-white. A smooth space between both pairs of legs.

Tail compressed, deep, ending in a somewhat blunt point. A thin narrow web extends from the snout along the back (where it is notched), and upper and under edges of the tail, to the vent.—This species is probably the "L. terrestris vulgaris ventre nigro maculata" of Ray (Quad. 264), though inserted as a variety of *L. agilis*. It is more frequently found in marshes, and out of the water, than the following.

7. *T. aquaticus*. Water Eft.—Skin soft, nearly smooth. Back greenish-brown, with dusky stripes. Belly orange, with dusky spots.

Lacerta aq. *Sibb.* Scot. 13.—Salamandra aq. *Ray*, Syn. Quad. 273.—Lacerta aq. *Linn.* Syst. i. 370.—L. maculata, *Shepp.* Linn. Trans. vii. 53. —In ponds, especially of stagnant water.

Length about 4 inches. Head depressed, with two lines of black dots. Sides spotted with brownish-black lines. Tail compressed, not so deep as in the preceding species, and tapers to a finer point. A similar web along the back, decreasing in size after the season of love.—This species is probably the Salamandra exigua, as the former seems to be the S. platycauda of Rusconi, an abridgment of whose curious observations on the metamorphoses of these animals is given in the Edin. Phil. Journ. N° xvii.

8. *T. vulgaris*. Brown Eft.—Above yellowish-brown, with dark spots and lines. Beneath red, with black dots.

Lacerta vulgaris, *Sibb.* Scot. 13.—*Linn.* Syst. i. 370.—Brown Lizard, *Penn.* Brit. Zool. iii. 24. *Shepp.* Lin. Trans. vii. 52.—Inhabits under stones in old walls and rubbish.

" *Head* compressed; upper part yellow-brown, marked with minute dark-brown spots; on the forehead, of some, is a large dark spot; under part yellowish-white. *Upper eye-lids* dark-brown; lower ones dull yellow. *Back* yellow-brown, with minute darker spots; two deep-brown lines reach from the head to the end of the tail. *Belly* and under part of the tail red, with a few black dots. *Tail*, sides ribbed with dark-brown. *Feet* without nails; fore-feet with four, and the hind ones with five toes. *Length* 4 inches."—*Sheppard.* The same observer adds, " *L. vul.* I have seen of all sizes, from one to four inches in length, but never in any other than a perfect state,—a sufficient proof that, like the rest of the *land* lizards, it undergoes no change; and that it is perfectly distinct from *L. palustris* and *maculata*, both of which attain to their full growth in the larva state." Should this species really prove to be ovoviviparous, it will probably exhibit other characters by which it may be separated from the aquatic species with which it is provisionally joined. Its history, however, is still involved in obscurity, and is, by many, considered as identical with *Triton aquaticus*.

GEN. VI. RANA. FROG.—Jaws and palate with teeth. Toes simple.

9. *R. temporaria*. Common Frog.—A black spot on each side of the head.

Rana, *Sibb.* Scot. 13.—R. aquatica, *Ray*, Syn. Quad. 247.—R. temp. *Linn.* Syst. i. 357. *Penn.* Brit. Zool. iii. 9.—*S*, Paddock; *W*, Llyffant melyn.—Common.

This common species, which requires no description, breeds earlier in the season than other species of the tribe. The eggs are laid in clusters in shallow ponds. The tadpoles are gregarious until they acquire the adult forms, when they quit the water, only returning to it occasionally.

10. *R. esculenta.* Edible Frog.—Middle of the back with a protuberance; sides, margined.

Linn. Syst. i. 257. *Penn.* Brit. Zool. iii. 13.—*W*, Llyffant melyn cefn grwm.—Not so common as the preceding.

Muzzle pointed. Body narrow behind, arched as if broken across. Above, green, with three longitudinal yellow lines; the middle one sunk; the lateral ones elevated. Below whitish, with black spots. Fore-feet with four divided toes; the hind feet with five, united by webs.

GEN. VII. BUFO. TOAD.—Jaws destitute of teeth. Body warty. Tongue short and thick.

11. *B. vulgaris.* Common Toad.—Body swollen. Head large, above dusky-black. Fore-feet with four divided toes; hind feet with six, united by webs.

Bufo, *Sibb.* Scot. 13. *Ray*, Syn. Quad. 252. Rana Bufo, *Linn.* Syst. i. 354. *Penn.* Brit. Zool. iii. 14.—*T*, Taed; *W*, Llyffant die, Llyffant dafadenog.

This well known animal, though a devourer of worms, slugs, and wasps, and therefore useful in gardens, though inoffensive in its manners, and destitute of any venomous quality, is despised, hated, and persecuted by the ignorant. Few individuals, even of education, will venture to take a toad in their hand, or act otherwise than loath it. How surprising that prejudices so unjustifiable should still continue to prevail!

12. *B. Rubeta.* Natter-Jack.—Above yellow, clouded with brown, with a mesial yellow line.

Rana Rubeta, *Linn.* Syst. Nat. i. 355. *Penn.* Brit. Zool. iii. 19. *Lacepede*, Ov. Quad. ii. 253.

This species, which differs from the preceding in having only five toes on the hind feet, is covered with porous pimples. The hind part is blunt, and scattered underneath with small points. Its motion is more liker running than either leaping or crawling. Mr Pennant says that it frequents dry and sandy places; is found on Putney Common, and also near Revesby Abbey, Lincolnshire, where it is called the Natter-Jack. Its history, like that of many of our native reptiles, is involved in obscurity.

Class IV. FISHES.

CLASS IV. FISHES.

ORDER I. CARTILAGINOUS FISHES. Bones soft, destitute of fibres; sutures of the cranium indistinct.

- TRIBE I. CHONDROPTERYGIOUS FISHES.--Gills fixed.
  - I. *Lips fitted to act as suckers. No pectoral or ventral fins.*
    - *a.* Seven branchial apertures on each side, with corresponding cavities.
      - Petromyzon.
      - Ammocetes.
    - *a a.* Two branchial apertures, with a ventral aspect, leading to six cavities internally.
      - Myxine.
  - II. *Lips unfit to act as suckers.*
    - *a.* Pectorals free.
      - *b.* Mouth under the snout, which is abbreviated and unarmed. Eyes lateral.
        - *c.* With temporal orifices.
          - *d.* With an anal fin. Two dorsal fins.
            - *e.* Teeth conical and pointed.
              - *f.* The first dorsal fin placed nearly above the pectorals.
                - Squalus.
                - Galeus.
              - *ff.* The first dorsal fin placed nearly above the ventrals.
                - Scyllium.
            - *e e.* Teeth blunt, closely set.
              - Mustelus.
          - *d d.* Destitute of an anal fin.
            - Spinax.
            - Scymnus.
        - *c c.* Destitute of temporal orifices.
          - Carcharias.
          - Lamna.
      - *b b.* Mouth terminal. Eyes with a dorsal aspect.
        - Squatina.
    - *a a.* Pectorals coalescing with the snout.
      - *b.* Gill openings, five on each side.
        - *c.* Tail fleshy, and of ordinary proportions.
          - Torpedo.
        - *c c.* Tail hard and slender.
          - *d.* Tail with a long serrated spine.
            - Trygon.
          - *d d.* Tail destitute of the serrated spine.
            - Raia.
      - *b b.* Gill openings single on each side.
        - Chimæra.
- TRIBE II.—Gills free.
  - Acipenser.

ORDER II. OSSEOUS FISHES. Bones hard, fibrous; sutures of the cranium distinct.

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CHONDROPTERYGIOUS FISHES.

GEN. I. PETROMYZON. LAMPREY. — Maxillary ring, armed with teeth. Mouth ovate, longitudinal.

1. *P. marinus.* Sea-Lamprey.—Marbled with black, brown, and yellow. The second dorsal and caudal fins disjoined.

> Lampetra, *Merr.* Pin. 188.—L. Rondeletii, *Will.* Ich. 105.—P. mar. *Linn.* Syst. i. 394. *Penn.* Brit. Zool. iii. 76.—*E*, Lamprey Eel; *W*, Llysowen bendol.—In the sea and large rivers frequent.

Length between two and three feet. Body of nearly equal thickness to the first dorsal-fin, when it decreases suddenly to the tail. Head rounded anteally, with a slight constriction over the eyes, and rather less than the body. The first dorsal-fin semicircular in its outline. The second rises gradually a little behind the former; and, after reaching its greatest breadth, somewhat suddenly, it gradually diminishes towards the tail. The tail is rounded; the rays at the end are short; and, on the under side, from opposite the second dorsal-fin, there is a ridge continued to the anus. Eyes lateral, in a small cavity in front of the gill-openings. Nostril, or short tube, situate in the middle, on the hind head. The sucker is a narrow border, surrounding the lips, consisting of an outer row of conical papillæ, and several inner rows of short, compressed, digitated, fringed processes. Secondary or moveable teeth, short, conical, or bifid, disposed in diverging and concentric rows. Primary teeth two; the one above, consisting of two contiguous processes; the one below larger, lunate, with seven conical processes. Tongue small, with several rows of small teeth. Gullet short; the alimentary canal simple. The gill-openings are seven on each side, ovate, transverse, having, on the ventral side, a minute tooth-like process. The cavities of the gills are lenticular, placed nearly vertically, having the gills disposed in ridges, in the direction of the apertures. The central apertures open into a common duct, by which the water entering from the mouth reaches the gills. It is probable, however, that while the animal is adhering to any object, and the mouth closed, water reaches the gills directly through the lateral or external openings. The hermaphroditism of this fish has been pointed out by Sir Everard Home, Phil. Trans. 1815, 266. The lamprey leaves the sea, its ordinary residence, and enters the larger rivers, during the spring months, for the purpose of spawning. The fish, when in season, is esteemed delicious.

2. *P. fluviatilis.* River Lamprey.—Dusky blue above, beneath silvery. The second dorsal-fin angular, and continuous with the tail fin.

> Lampetra fluviatilis, *Merr.* Pin. 188.—Lampetra, *Sibb.* Scot. 25.—*Will.* Ich. 104.—P. fluv. *Linn.* Syst. Nat. i. 394. *Penn.* Brit. Zool. iii. 79.—*E*, Lampern, Lesser Lamprey; *S*, Nine-eyed eel; *W*, Lleprog.—In rivers and the sea.

Length about 10 inches. The first dorsal-fin is angular, and remote from the second. The secondary teeth are less numerous than in the lamprey; but, in the absence of specimens, at present, it would be difficult to say more on the armature of the mouth, without running great risk of error, especially as the descriptions of Artedi, Pennant, Bloch, Lacepede, and Donovan (which I have consulted), differ widely from one another. It is probable, that the number and disposition of the teeth vary according to the age of the individual.—This species enters the rivers from the sea, in the beginning of the year; spawns in March or April; and, about mid-summer, returns again to the ocean.

The *P. Juræ*, which Dr MacCulloch describes and figures in his "Western Islands," ii. 186, tab. xxix. fig. 1. probably belongs to this species, with which it agrees in external characters. The differences in the teeth are at present of doubtful value.

GEN. II. AMMOCŒTES. PRIDE.—Maxillary ring without teeth. Lips semicircular.

3. *A branchialis.* Common Pride.—The two dorsal fins narrow, united with each other and with the tail.

Lampetra parva fluviatilis, *Merr.* Pin. 188. *Ray*, Syn. Pisc. 36.—Petromyzon branchialis, *Linn.* Syst. i. 394. *Penn.* Brit. Zool. iii. 80.—*E* Stone Grig.—In rivers in England.

This species seldom exceeds 8 inches in length, and a quarter of an inch in diameter. The body is marked by numerous transverse lines, giving it an annulated appearance. Tail lanceolate.—Frequent in the rivers near Oxford, and other places of England, lodging in the mud.

GEN. III. MYXINE. HAG.—A temporal orifice. Mouth round, the margin with eight processes, and a single large tooth in the palate.

4. *M. glutinosa.* Glutinous Hag.—Dorsal fin narrow, continued round the tail to the vent.

Linn. Syst. ii. 1080. *Penn.* Brit. Zool. iv. p. 39, tab. xx. f. 15.—On the English coast.

Length about 8 inches. Body nearly cylindrical, and destitute of eyes or scales. Margin of the tongue, on each side, with a series of pectinated teeth. —This species, which seems to have been confounded with the preceding, by Willoughby and Ray, and which was placed by Linneus among the vermes, inhabits the ocean. It enters the mouths of fish when on the hooks of lines that remain a tide under water, and totally devours the carcase, except skin and bones. The Scarborough fishermen often take it in the *robbed fish*, on drawing up their lines. It is the Gastrobranchus of Bloch.

Pristis Antiquorum. The late Dr Walker, in his MS. Adversaria for 1769, p. 41, when noticing some British fishes not in Pennant, adds, in reference to this species, "Found sometimes in Loch Long." I have not met with any other proof of its ever having visited the British shores.

GEN. IV. SQUALUS. SAIL-FISH.—Teeth simple, conical, pointed. The first dorsal fin nearly above the pectorals.

5. S. *maximus.* Common Sail-Fish.—Branchial apertures extending nearly across the neck, in front of the pectorals.

Linn. Syst. 400.—Basking Shark, *Penn.* Brit. Zool. iii. 101. tab. xiii. *Home*, Phil. Trans. 1809, p. 208.—*E*, Sun-fish; *G*, Cærban; *N*, Brugdé.—Common on the west coast.

Length about 30 feet. Body bluish above, white below. Skin smooth, when the hand passes over it from head to tail; rough, like a file, in the opposite direction. Upper jaw longest, blunt. The nostrils open on the edge of the upper lip. Eyes small. Temporal orifices half way between the eyes and the gills. The first dorsal fin situate midway between the pectorals and ventrals. The second between the ventrals and setting on of the tail. Sides of the body, towards the tail, with a scabrous ridge. A deep transverse sulcus on the back, at the base of the tail, the lobes of which are unequal, the upper being the largest. Tongue flat.—This species is ovoviviparous. It approaches the shores of the western coasts in May, and continues until July. In swimming, the dorsal-fin is often above the surface of the water. This is a stupid fish, and will suffer boats to approach without being alarmed. When struck with a harpoon, it usually descends to the bottom, and is somewhat difficult to kill. The liver of a full-sized fish yields from 8 to 12 barrels of oil.

GEN. V. GALEUS. TOPE.—Teeth notched. Tail-fin irregular. The first dorsal-fin nearly above the pectorals.

6. G. *vulgaris.* Common Tope.—Branchial openings short.

Galeus piscis, *Charl.* Onomasticon Zoicum, 209.—Canis Galeus, *Will.* Ich. 51.—Squalus Galeus, *Linn.* Syst. i. 399. *Penn.* Brit. Zool. iii. 111. *Bloch*, Ich. tab. 118.—On the coast, but rare.

This species is about 5 feet long. The back is grey, the belly white. Nose produced, pointed, translucent. Teeth small, sharp, triangular, and serrated on their inner edge. Skin rough, when stroked from the tail towards the head. According to Tyson, who has given minute details of the anatomical structure of this species, it is ovoviviparous, *Will.* Ich. App. p. 13. Willoughby states that the flesh is tender and not unpleasant.

GEN. VI. SCYLLIUM. BOUNCE.—Nostrils near the mouth, with a valvular lobe, and a groove leading to the lips. Inferior lobe of the tail-fin divided. Oviparous.

7. S. *stellare.* Ventral-fins disjoined.

Catulus maximus, *Will.* Ich. 63.—Squalus cinereus, pinnis ventralibus discretis, *Artedi*, Ich. gen. 69, syn. 97.—S. stellaris, *Linn.* Syst. i. 399.—Spotted dog-fish, *Penn.* Brit. Zool. iii. 113.—On the English coast.

Length about 3 feet. Colour greyish, with large, rather distant, black spots. Nose blunt, pierced on the lower surface by numerous pores. Eyes oblong. Teeth small, sharp, smooth at their sides, strait, and disposed in furrows. The first dorsal-fin placed nearly over the ventral-fins.

8. S. *Catulus.* Bounce or Morgay.—Ventral fins united.

Catulus major, *Will.* Ich. p. 62. cap. xv. p. 64, cap. xvii.—Squalus dorso vario, pinnis ventralibus concretis, *Artedi*, Ich. gen. p. 89, syn. p. 97.—Sq. Cat. *Linn.* Syst. i. 400.—Lesser Spotted Dog-fish, *Penn.* Brit. Zool. iii. 115, *Donovan*, Brit. Fishes, tab. lv.—On the English coast, common.

Length 2½ feet. Colour brownish, with numerous black spots; belly white. Teeth acute, recurved, and, according to Bloch (tab. 114) tricuspidate.—This species is considered as differing from the former in the reddish colour, in the spots being of a less size, but more numerous; the snout being shorter; the nostrils nearer the lips; the ventral fins united; the anal fin nearer the tail. These characters seem to indicate specific, though they may prove only sexual differences. Broussonnet and Lacepede consider the S. *stellare* as the female, an opinion probably correct; but, as both species occur on the southern coast, we may hope that some resident naturalist will favour us with a detailed description of their peculiarities. Mr Donovan adds, that the lesser spotted dog-fish is often captured by the fishermen, in the net, while trawling for flat fish.

GEN. VII. MUSTELUS. Teeth blunt, and closely set. Dorsal-fins without spines.

9. M. *lævis.* Smooth-hound.—Body greyish above, white below, and destitute of spots.

> Galeus Mustelus, *Sibb.* Scot. 23.—Mustelus lævis, *Will.* Ich. 60.—S. dentibus obtusis seu granulosis, *Art.* Ich. gen. 66. syn. 93.—S. Mustelus, *Linn.* Syst. i. 400. *Penn.* Brit. Zool. iii. 116. *Leach*, Wern. Mem. ii. 63.—*S*, Murloch.—Found occasionally on all parts of the coast.

Length about 6 feet. Nose blunt. The branchial apertures above a line drawn between the corners of the mouth and the base of the pectorals. The pavement of teeth in the mouth (like the skate), readily serves as the distinguishing mark of this species. It is ovoviviparous. In the Hebrides, it is used as food, and esteemed a very delicate fish. St. Acct. vol. xii. 322.

GEN. VIII. SPINAX. DOG-FISH.—Each dorsal-fin with a free spine at its anteal margin. Teeth small, with a cutting edge.

10. S. *Acanthias.* Common Dog-fish.—Back greyish-brown, belly white. Nostrils not terminal.

> Galeus acanthias, *Sibb.* Scot. *Will.* Ich. 56.—Squalus pinna anali nulla, corpore subrotundo. *Art.* Ich. Decs. 102.—S. acanthias, *Linn.* Syst. i. 397.—Picked Dog-fish, *Penn.* Brit. Zool. iii. 100.—*S*, Sea-dog; *N*, Hoe. —Common, on the coast.

Length about 3 feet. The snout is long, but blunt. The nostrils are placed about midway between the eyes and the end of the snout, with a ventral aspect.—This common species is ovoviviparous. Its reproductive organs are described by Sir E. Home, Phil. Trans. 1810, p. 205. It abounds, especially on the Scottish coast, and is often taken in the herring-nets. Its flesh is not unpalatable, and is frequently salted and dried, in the Northern Isles, for winter food. A good deal of oil is annually obtained from this species, the livers of 20 individuals yielding about a Scotch pint.

GEN. IX. SCYMNUS.—Dorsal-fins without spines.

11. S. *borealis.* Greenland Shark.—The first dorsal-fin larger than the second; more advanced than the ventrals.

> Squalus carcharias, *Mull.* Prod. Zool. Dan. 38. *Fab.* Fauna Gr. 127. *Bloch*, Ich. tab. 119.—S. borealis, *Scoresby's* Arct. Reg. 558, tab. xv. f. 3. 4.—North of Scotland.

Length about 14, circumference 8 feet. Colour grey. Eye blue, pupil emerald-green. Mouth wide. Teeth in the upper jaw, broad at the base, suddenly becoming narrow and lanceolate with the cutting-edges rough; in the lower jaw the teeth are pyramidal, compressed, the cutting-edges crenulated, a little convex on the fore-edge, and subangularly concave on the hind-edge. Tongue broad and short. Pectorals large; ventrals elongated, the two sides nearly parallel.—This species has long been confounded, by the northern naturalists, with the *Carcharias vulgaris* of lower latitudes, under the name Squalus carcharias. Mr Scoresby, in his valuable work on the "Arctic Regions," misled by having observed a parasitic entomoda attached to the eye, which he regarded as an appendage in organical connection, concluded, under the influence of this mistake, that the Greenland shark had not been previously described. Cuvier first instituted the genus for the reception of the Squalus Americanus of Gmelin (Le Squale Liche of Lacepede, the S. Nicæensis of Risso), and the S. Carcharias of Gunner and Fabricius. The figure by Bloch, differs from the Greenland shark, in the shape of the tail; and from the true carcharias still more, in the presence of the temporal orifices. It was probably intended to represent the former species. I am in possession of the jaws of an individual of the Greenland shark, presented to me by the late Mr Simmonds, and which was caught, in his presence, in the Pentland Frith, in 1803. Mr Edmonston witnessed one 13½ feet long, which was found dead at Burra Firth, Unst, in July 1824.

GEN. X. CARCHARIAS.—Last of the branchial openings above the pectorals. Snout depressed; the nostrils in the middle, below.

12. C. *vulgaris.*—Teeth triangular, with straight crenulated cutting edges.

Canis Carcharias, *Will.* Ich. 47. *Sibb*, Fife, 118.—White Shark, *Penn.* Brit. Zool. iii. 106. *Risso*, Ich. Nice, 25.—Rare in the British Seas.

Length about 30 feet. Brownish above, white below, with two rows of black pores on the sides. Eyes round, white, with a black pupil. Pectorals large, triangular. The first dorsal is rounded; the second imbedded in a cavity. Upper lobe of the tail-fin twice as long as the lower.—This species is recorded by Willoughby, Sibbald, and Pennant, without details respecting the season or place of appearance on our shores. Grew says, "They are found sometimes upon our coast, near Cornwall." *Rarities*, p. 90.

13. C. *glaucus.*—Dorsal and ventral ridge indented at the setting on of the tail.

Galeus glaucus, *Will.* Ich. 49.—Squalus fossula triangulari in extremo dorso, foraminibus nullis ad oculos, *Art.* Ich. syn. 98.—S. glaucus, *Linn.* Syst. i. 401.—Blue Shark, *Penn.* Brit. Zool. iii. 109. *Watson*, Phil. Trans. 1778, p. 789, tab. xii.—Not uncommon.

Length about 6 feet. Back blue; belly white. Body lengthened; snout pointed. Teeth triangular, finely serrated. Pectorals pointed. Anal and second dorsal fins opposite. Upper lobe of the tail produced.—This species visits the coast of Cornwall during the pilchard season.

14. C. *Vulpes.* Thresher.—Tail nearly equal in length to the body.

Vulpes marina, *Will.* Ich. 54. *Sibb.* Fife, 119.—Vulpecula, *Borl.* Corn. 265.—Long-tailed Shark, *Penn.* Brit. Zool. iii. 110.—Found occasionally on the coast.

Total length about 13, of the tail about 6 feet; the upper lobe of the latter extending nearly in a straight line. Body round, short, skin grey on the back, white on the belly, and smooth. Nose short, pointed. Eyes large, over the corners of the mouth. Teeth triangular. Borlase says, "This shark we call the Thresher, from the motion of its long fox-like tail, with which it strikes or thrashes its larger and less agile enemy, the grampus, whenever it reaches the surface of the water to respire."

GEN. XI. LAMNA. PORBEAGLE.—Branchial openings in front of the pectorals. Snout conical. Nostrils at the base below.

15. L. *cornubica.*—Teeth produced, slender, with two processes on each side at their base.

Porbeagle, *Borl.* Corn. 265. tab. xxvi. f. 4. *Penn.* Brit. Zool. iii. 117., and Beaumaris Shark, ib. 118. tab. xvii., and 2d edition.—Squalus cornubicus, *Goodenough*, Linn. Trans. iii. 80. tab. iii. *Donovan*, Brit. Fishes, tab. cviii.—S. Selanonus, *Leach*, Wern. Mem. ii. 64. tab. ii. f. 2.—Not uncommon.

Length from 5 to 9 feet. Colour bluish on the back, white on the belly. Snout projecting. Pectorals semilunar, the first dorsal, nearly immediately above. Ventrals small. Posterior, dorsal, and anal fins small, opposite. Body contracted above and below at the setting on of the tail. Small tubercles on the lateral line. A ridge extending from the tail on each side the body towards the middle. Tail semilunar, the upper lobe rather largest. This species is said to hunt its prey in companies. Its history as a British fish has become much involved in error. Pennant, by adding the Beaumaris shark as a new species, when, with the single exception of its apparently shorter snout, its claims were insufficient, and by publishing an inaccurate engraving from an accurate drawing by the Reverend Hugh Davis, introduced the confusion. Donovan advanced a step towards a reformation, by having examined the original drawing of Davis, and found it to correspond with the Porbeagle. The editor of the edition (1812) of Pennant's British Zoology, from a re-examination of the drawing of Mr Davis, asserts, that it "corresponds exactly with the original plate;" yet, by a management which seems inexplicable, the engraving in the new edition is changed in many of its most important features, so as to bear evident marks of differing from the former plate, pronounced an accurate copy of the drawing. Dr Leach seems to have described from a stuffed specimen of the Porbeagle his *Squalus selanonius*, supposing it to be Dr Walker's new species *S. selanonius*, and which he regards as similar to the *Squalus maximus.* The Porbeagle is ovoviviparous.—It is occasionally caught in the herring-nets.

* * *

Squalus selanoneus.—This species was found by the late Dr Walker, in Lochfyne, in Argyleshire (whence the name from Lochfyne, *Sinus selanoneus* of Ptolemy), where it appears during the herring season. Stewart, in his "Elements of Nat. Hist. i. 320.," inserts it in the section without the anal fin, but with temporal orifices. In the description of this species in Dr Walker's MS. Adversaria for 1769, p. 155., now before me, there is no notice taken either of the anal fin or temporal orifices, so that I am inclined to infer the absence of both. Should this be the case, it will claim to rank as a new genus, occupying a place between Charcharias and Lamna. I shall here add the description as it appears in the original. "CAPUT, maxilla subæqualis, superiore prominente, rostrata. Maxilla superior crassissima apice truncata marginata, angulo superiori obtuso suberecto. Maxilla inferior angusta. Dentes numerosi acuti. Oculi super cantham oris positi sunt. CORPUS, 8-pedale oblongum, teretiusculum, cute aspera. Spiracula 5, antico breviore, erecta, lineari-lunata: margine postico curvato. Tria spiracula postica super pinnam pectoralem positi sunt, duo altera ante pinnam pectoralem versus oculum. Pinnæ: dorsum suberectum muticum bipinne. Pinna dorsalis antica erecta, subpedalis, circa medium corporis. Pinna dorsalis postica, multo minor, medium inter pinnam anticam et caudam occupat. Pinnæ pectorales pedem longitudine superant, et ante pinnam anticam dorsalem positæ sunt. Pinnæ ventrales spatiam ante pinnam dorsalem posticam occupant. Cauda, perpendicularis furcata segmentis subæqualibus subacutis: superiori longiori.—Sore prolato, maxillis subæqualibus; superiore truncata emarginata. There is not a vestige of this animal in Linnæus, Willoughby, Artedi, or Pennant." The form of the snout, the position of the fins, and the relation of the gill-openings to the pectorals, mark a distinct species, and even genus, which may be termed Selanonius *Walkeri*.

The remains of the teeth of many species of sharks occur in the different strata, from those of the independent coal formation, to the more recent series of marine deposits. They constitute the Glossopetræ of the older writers.

Gen. XII. SQUATINA. Monk-fish.—Body depressed. Temporal orifices. No anal-fin.

16. S. *vulgaris*.—Pectorals large, armed in front with short pointed curved spines.

Squatina, *Merr.* Pin. 186. *Sibb.* Scot. 24. *Will.* Ich. 79.—Squalus Squatina, *Linn.* Syst. 398. *Penn.* Brit. Zool. iii. 98. *Don.* Brit. Fish. tab. xvii.—Monkfish and Lewis, *Couch*, Linn. Trans. xiv. 90.—*E*, Kingstone, Angel-fish.—On the coast.

Length 5 to 8 feet. Body above, brownish-grey, white beneath; the skin rough. Head broad, emarginate in front. Teeth numerous, broad at the base, pointed above. Tongue broad, sharp, pointed. Tubercles or spines near the eyes. A rough line down the middle of the back. Two dorsal fins near the tail, which is divided into nearly equal lobes. This fish keeps near the bottom, and is only taken in nets. It is fierce and dangerous to be approached. The size of the pectorals, resembling wings, has procured for it the name of *Angel-fish*.

Gen. XIII. TORPEDO. Cramp-fish.—Sides of the snout rounded. Furnished with electrical organs.

17. T. *vulgaris*. Common Cramp-fish.—Skin smooth.

Raia Torpedo, *Linn.* Syst. i. 395. *Walsh*, Phil. Trans. 1773, p. 461. tab. xix., and ib. 1774, p. 464. *Penn.* Brit. Zool. iii. 89.—On the southern English and Irish coasts.

Length about 2 feet. Colour, usually brown above, and white beneath. Head and body nearly round. Mouth small, teeth minute. Temporal orifices with fringed margins. Eyes small. The two dorsal fins placed near the caudal, which is broad and abrupt. This species was first recorded as occurring on the Irish coast, by Smith (Hist. Waterford, 271., Pennant), and afterwards noticed by Walsh, as not uncommon on the English coast. If the colour-markings be assumed as suitable characters for distinguishing species (in opposition to the testimony of Mr Tod, Phil. Trans. 1816, p. 21.), the British species will belong to the T. marmorata of *Risso*, Ich. Nice, 18.

Gen. XIV. TRYGON.—Head uniting to form with the pectorals an obtuse angle. Teeth granulated.

18. T. *Pastinaca.* Common Trygon.—Tail destitute of fins. Body smooth.

Aquila piscis, *Merr.* Pin. 185.—Pastinaca marina, *Sibb.* Scot. 23. *Will.* Ich. 67.—Raia Pastinaca, *Linn.* Syst. i. 396.—Sting Ray, *Penn.* Brit. Zool. iii. 95.—*E*, Fire Flaire.—On the southern coast of England.

Length between two and three feet. Body rounded; thick in the middle. Nose short, pointed. Tail thick at the base, nearer to which than to the extremity is the *spine*, which is depressed, thin on the edges, pointed, and serrated. This spine is renewed annually; sometimes the new one appears before the old one drops off, in which state it is the Cardinal Trilost of the Cornish fishermen.—With this spine the animal is capable of inflicting a severe wound.

* * *

In the British Zoology, Mr Pennant takes notice of a fish, which he terms the *White Ray*, and of which he gives the following notice: " Mr Travis, surgeon at Scarborough, had, in the summer of 1769, the tail of a ray brought to him by a fisherman of that town: he had taken it in the sea off the coast, but flung away the body. It was about 3 feet long, extremely slender and taper, and destitute of a fin at the end. I believe it to belong to the species called by the Brazilians Jaberete; and that it is likewise found in the Sicilian Seas. I once received the tail of one from that island, corresponding with the description Mr Travis gave: I must also add, that it was entirely covered with hard obtuse tubercles," Brit. Zool. iii. 88.—The species to which this portion belonged, is considered by the editor of the last edition of the British Zoology, as the *Raia aquila* of Linnæus, now the type of the genus Myliobatis of Dumeril. The tail received by Mr Pennant from Sicily, seems to have belonged to the Cephaloptera Giorna, *Risso*, *Ich.* 14.

Portions of the caudal spine of a fossil species of this genus have occurred at Highgate, Geol. Trans. ii. 206.

GEN. XV. RAIA.—Disc rhomboidal. Tail with fins at the extremity. The males with hooked spines on the pectorals.

* *Body above irregularly covered with large deflected spines.*

19. R. *clavata.* Thorn-back.—Base of the spines broad, entire, the centre projecting, subulate and deflected.

Thornback, *Merr.* Pin. 185. *Sibb.* Scot. 24. *Will.* Ich. 74. *Artedi*, Ich. Desc. 103. *Linn.* Syst. i. 397. *Penn.* Brit. Zool. iii. 93.—Common.

Length upwards of two feet. Skin shagreened, freckled above, white below. A row of strong prickles down the back, and three rows on the tail, with numerous smaller ones. Teeth of the female granulated, of the male pointed. The young, termed *Maids* or *Maiden-skate*, are generally spotted with white, according to Montagu, who adds, that the "wings were generally not so rough, and sometimes quite smooth about the middle. A variety also of this fish had an oblong dusky spot surrounded with white, in the middle of each wing," Wern. Mem. ii. 417.

20. R. *radiata.* Starry Ray.—Base of the spines enlarged, radiated.

R. Fullonica, *Fab.* Fauna Gr. 125.—R. rad. *Don.* Brit. Fishes, tab. cxiv. —On the north coast.

Front obtuse; snout slightly prominent. The spines are of two kinds.

Those with a subulate extremity and a broad radiated base, cover the surface of the pectorals and in front of the eyes. Those which are large, conical, curved, with a grooved base, occur, one in front of each eye, a few immediately behind, and a prominent row along the middle of the back and ridge of the tail. Small spines occur in the loins and on each side of the eyes.—This species was first announced as British by Mr Donovan, who procured a young one in London, from the north coast. It is evidently the R. *Fullonica* of Fabricius, who describes the armature with his accustomed precision. The teeth, he adds, are broad at the base, elevated, pointed, and recurved at their inner edge.

** *Central ridge of spines continued from the tail along the back.*

21. R. *oxyrinchus.* Sharp-nosed Ray.—Snout produced, the margins subparallel.

Will. Ich. 71. *Linn.* Syst. i. 395. *Penn.* Brit. Zool. iii. 83.—*S*, White Skate, Friar Skate, May Skate, Mavis Skate.—Not rare.

In the length of the body this species sometimes exceeds 6 feet, and weighs nearly 500 lb. The body is remarkably depressed. The skin is quite smooth, brown above, white beneath. Teeth sharp pointed, recurved, and broad at the base. Tail short, with three rows of spines, the mesial one continued to the head; spines at the eyes.

22. R. *rubus.* Rough Ray.—Above rough, with minute spines. Three rows of large spines on the tail.

Rough Ray and Fuller Ray, *Penn.* Brit. Zool. iii. 85.—*Block* Ich. tab. 84.—*Don.* Brit. Fishes, tab. xx.—*E*, Sand Ray; *S*, Hommelin.

Length upwards of 3 feet. Nose short. Body, above, yellowish-brown, with dark spots; beneath, white. Spines around the eyes and on the snout.—The spines likewise occur on the lower surface. Ventrals with only three rays. Teeth pointed.

23. R. *microcellata.* Small-eyed Ray.—Above, rough, with minute spines; one row of small-hooked spines on the tail, continuing along the dorsal ridge to the head.

Mont. Wern. Mem. ii. 430.—South-west coast of England.

Length 20 inches. Colour, above, brown, with pale scattered spots and lines; below, white and smooth. Snout obtuse. Eyes very small, a spine in front, several smaller ones behind. Teeth obtusely cuneiform, with a broad edge, that feels rough to the finger as it is withdrawn from the mouth. Were it not for the spines in the tail being in a single row, instead of three rows, a circumstance which may depend on age, it might be considered as the R. *punctata* of Risso, *Ich.* p. 12.

*** *Middle of the back destitute of large spines.*

24. R. *Batis.* Skate.—Skin rough. Three rows of spines on the tail; the points of those in the lateral rows directed forwards.

R. lævis, *Merr.* Pen. 785. *Sibb.* Scot. 24. *Will.* Ich. 69.—R. Batis, *Linn.* Syst. i. 395. *Penn.* Brit. Zool. iii. 82.—*E*, Homelyn, Guilthead; *S*, Blue Skate, Grey Skate, Dinnen Skate.—Common.

This species sometimes reaches the weight of 200 pounds. Colour, above, dark brown; beneath, dusky grey, with dark spots. Snout conical. Teeth sharp, with a broad base.

25. R. *aspera.* Shagreen Ray.—Skin rough. Ridge of the tail destitute of spines; those in the row on each side projecting outwards and recurved.

Will. Ich. 78.—Shagreen Ray, *Penn.* Brit. Zool. iii. 87.—R. chagrinea, *Mont.* Wern. Mem. ii. 420. tab. xxi.—*E*, White horse, Duncow, French Ray.—On the English coast.

Length about 3 feet. Snout long, spinous. Colour, above, cinereous-brown with black spots; beneath, white. The whole upper surface very rough. Spines near the eyes. A short row of spines on the dorsal ridge, immediately behind the eyes.

26. R. *oculata.* Mirror Ray.—Skin smooth above and below, except on the margin of the pectorals. Three rows of spines on the tail, the mesial one reaching a short way up the back.

R. lævis oculata, *Will.* Ich. 72.—R. miraletus, *Don.* Brit. Fishes, tab. ciii.—On the English coast.

Length about 10 inches. In form resembling the skate. Aculeated near the eyes. A large ocellated spot on the pectorals. Colour, above, brown, with distant large dark spots. Montagu included this species and R. *rubus* under the title R. *maculata.*

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27. R. *marginata.* Bordered Ray.—Belly white, surrounded with a black margin, except at the head.

La Raie bordeé, *Lacepede*, Hist. Poiss. v. 663, t. xx. f. 2. Liverpool and Brighton, *Noel.*

This species, of which a description was communicated by M. Noel to the ichthyologist quoted, seems to be of a small size. The snout is pointed and translucent. Skin of the back yellow. Three rows of spines on the tail. A spine behind each eye; a single dorsal fin on the tail, and a caudal fin.

28. R. *Cuvieri.* Cuvierian Ray.—The first dorsal fin on the middle of the back.

Lacepede, Hist. Poiss. i. tab. vii. f. 1. *Neill*, Wern. Mem. i. 554.

Snout pointed. Tail slender, armed with three rows of spines, the middle one reaching to the fin on the back. This fin is longer than broad, suboval, and contracted at the base. Teeth blunt. This species was first procured from the Seine by Baron Cuvier in 1792, who communicated a drawing and description of it to Lacepede. It has once occurred on the Scottish coast in the Frith of Forth in 1808, according to Mr Neill, who examined a putrescent specimen, which had been detected among a cargo of thornbacks, and who has since presented to me the remarkable dorsal fin, the only portion which was preserved.

GEN. XVI. CHIMÆRA. RABBIT-FISH.—Snout conical. Two broad incisors in each jaw.

29. C. *monstrosa.* — Colour silvery-white, marbled with brown.

Galeus acanthias Clusii, *Will.* Ich. 57.—Ch. mon. *Linn.* Syst. i. 401. *Bloch*, Ich. tab. 124. *Don.* Brit. Fishes, tab. cxi.—In the north seas.

Length nearly 3 feet. Body compressed. Head blunt, the snout subascending, blunt. A narrow crenulated grinder on each side in the lower jaw, and a broad tubercular one corresponding above. Nostrils immediately above the upper lip contiguous, each with a cartilaginous complicated valve. Bronchial openings in front of the pectorals. Eyes large, lateral. Lateral line connected with numerous waved anastomosing grooves on the cheeks and face. On the crown in front of the eyes, a thin osseous plate, bent forwards, with a spinous disc at the extremity on the lower side. The first dorsal fin above the pectorals narrow, with a strong spine along the anteal edge. The second dorsal arises immediately behind the first, is narrow, and is continued to the caudal one, where it terminates suddenly. The pectorals are large, and subtriangular. Ventrals rounded, in front of each a broad recurved osseous plate, with recurved spines on the ventral edge. Claspers pedunculated, divided into three linear segments, the anteal one simple, the retral ones having the opposite edges covered with numerous small reflected spines. A small anal fin opposite the extremity of the second dorsal. Caudal fin above and below, broadest near the origin, gradually decreasing to a linear produced thread. This species was known to Dr Walker as an inhabitant of the Zetland seas. The specimen, from which the preceding description was taken, was sent from thence through the kind attention of Laurence Edmonston, Esq. Surgeon, Unst, where it is termed the Rabbit-fish.

GEN. XVII. ACIPENSER. STURGEON.—Mouth protrusile, without teeth. Snout conical.

30. A. *Sturio.*—Body with five rows of large osseous scales.

Merr. Pin. 188. *Sibb.* Scot. 25. *Will* Ich. 239. *Linn.* Syst. 403. *Penn.* Brit. Zool. iii. 124. *Don.* Brit. Fishes, tab. lxv.—Occasionally found in rivers.

Length reaching to 18 feet. Body grey above, white below, pentangular. Snout slender, subdepressed, hard. Mouth small, circular and tubular, between which and the extremity of the snout are four beards in a transverse row. Eyes small. Nostrils double. Gill opening semicircular. A row of large radiated osseous scales, with a mesial crest, commences at the crown, and is continued to the tail; another on each side of the body, and another on each side of the belly; the rest of the skin rough. All the fins are triangular. The anal and dorsal fins opposite.. Upper lobe of the tail considerably produced.—This species is occasionally caught in the larger rivers by the salmon nets, in the summer season, having left the sea for the purpose of spawning.

The fish referred to by Merret in his Pinax, p. 188, was probably the A. *Huso.* "Acipenseri congener, cui valde similis excepto capite saporis delicatissimi, captus erat in Insula Vecti, anno 1664. Ds. Cole, qui ipsum delineavit exsiccavitque."

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At the conclusion of this enumeration of the Cartilaginous Fishes of this country, the Sea Snake, an animal which was cast ashore on Stronsa, Orkney, in 1808, merits some notice. It came ashore dead, and in a mutilated state. From the affidavits of those who had an opportunity of inspecting it, it appears to have been upwards of 55 feet in length, and not above 5 or 6 feet in circumference where thickest. Filaments, resembling a mane, extended along the back, the remnants, probably, of a dorsal fin; and three articulated members on each side, presented themselves, probably the remains of pectorals, ventrals, and claspers. The whole evidence respecting this animal, as published in the Wern. Mem. i. 431, and the accompanying observations by Dr Barclay, render probable the opinion, that it is a species of a genus not yet established in the systems of zoologists. Sir Everard Home is inclined to consider it as nothing more than a *Squalus maximus;* an opinion deriving no support from any circumstance yet published respecting it. It has been conjectured, that the Stronsa animal may be the same as the Sea Snake of Pontoppidan.

The animal referred to by the Rev. Mr Maclean of Small Isles, Wern. Mem. i. 442, which erected its broad oval head and narrow neck above the water, and gave chase to the boat in which he was, may have been similar to the Stronsa animal; but its motions, especially raising its head above the water, and viewing distant objects, intimate its want of connection with the class of Fishes.

OSSEOUS FISHES.

TRIBE I. Jaws imperfect, exposed and covered with ivory.
  a. Body capable of spontaneous inflation.
    Tetraodon.
  a a. Body incapable of inflation.
    Orthagoriscus.
TRIBE II. Jaws perfect.
  a. Gills interrupted, in tufts. Mouth terminal.
    Syngnathus.
  a a. Gills on the arches in continuous pectinated ridges.

MALACOPTERYGIOUS FISHES. Fins supported by cartilaginous articulated rays.

ACANTHOPTERYGIOUS FISHES. The first rays of the dorsal, anal, and ventral fins, supported by simple spinous rays.

GEN. XVIII. TETRAODON.—Jaws with a suture, giving the appearance of four teeth in front. Body tapering behind. Belly spinous.

31. T. *stellatus.*—Abdominal spines straight, arising from a root of four rays.

Globe Diodon, *Penn.* Brit. Zool. iii. 132.—T. stellatus, *Don.* Brit. Fishes, tab. 66.—Rare on the English coast.

Length about a foot and a half. Back blue; belly white. The whole surface of the abdomen covered with distinct and rather distant spines. Dorsal fin of 11, pectoral of 14, anal of 10, and caudal of 6 rays. Mouth small; irides white, tinged with red. Middle of the tail prominent. Pennant appears first to have described this species, from a specimen taken at Penzance in Cornwall. Mr Donovan mentions a second example from the Cornish coast, in the collection of the late Mr John Hunter.

Gen. XIX. ORTHAGORISCUS. Molebut.—Jaws undivided. Body, retrally, as if truncated; belly smooth.

32. O. *Mola.*—Skin rough. Gill-openings oval.

Mola Salviani, *Sibb.* Scot. 24.—*Will.* Ich. 151. *Borlase*, Corn. 267.—Tetrodon Mola, *Linn.* Syst. i. 412. — Short Diodon, *Penn.* Brit. Zool. iii. 131.—T. Mola, *Don.* Brit. Fishes, tab. 25.—Occasionally taken in the British seas.

Length about 2 feet; weight about 100 pounds. Body compressed, nearly round, carinated dorsally and ventrally. Back mottled, dusky, belly silvery. Mouth, notrils and eyes, small. Pectorals small, of 12 rays. Dorsal and ventral fins produced, opposite, the former of 18, the latter of 16 rays. These two fins are connected with the caudal fin, which contains 18 large rays. This species was first observed by Sir Andrew Balfour, in the Frith of Forth (*Mem. Balf.* p. 80.), afterwards by Willoughby, at Penzance. It has occurred on many other parts of the coast. Risso states that they are taken at Nice in great numbers, and yield much oil, but the flesh is bad, Ich. p. 61.

33. O. *truncatus.*—Skin smooth. Gill-openings semilunar.

Sun-fish, *Borlase*, Corn. 267.—Oblong Diodon, *Penn.* Brit. Zool. iii. 129. Tetrodon trun. *Don.* Brit. Fishes.—On the English coast, along with the preceding.

Weight from 200 to 500 pounds. Body oblong, more produced than the Mola. Colour on the back mottled, dusky; on the belly silvery; dark vertical stripes on the sides of the shoulders. Pectorals of 14, dorsal of 12, anal of 15, and caudal of 17 rays.

Gen. XX. SYNGNATHUS. Pipe-Fish.—Mouth tubular. Gill-openings on the neck. No ventrals.

I. *With Pectoral fins.*

a. With a caudal fin.
b. With an anal fin.

34. S. *Acus.*—Body heptangular, tail quadrangular. Crown of the head carinated.

Acus Aristotelis species altera major, *Will.* Ich. 159.—Sea-Adder, *Borl.* Corn. 267.—Syn. Acus, *Linn.* Syst. i. 416.—*Low*, Hist. Ork. 181.—Under stones near low water-mark.

Length upwards of a foot. Back brown, spotted; belly whitish. Scales of the body radiated. Snout narrower than the head, depressed and compressed. Dorsal-fin of about 38 rays, with a black line on each side; pectorals 14, anal 6, and caudal 10 rayed.

35. S. *Typhle.*—Body hexangular; tail quadrangular; crown flat.

Acus Aristotelis, *Will.* Ich. 158.—S. Typh. *Linn.* Syst. i. 416. *Don.* Brit. Fishes, tab. 56.—Found along with the former.

Pennant, Montagu, and some other ichthyologists, consider these two species as identical, the ventral carina of the latter being only somewhat indistinct. Donovan, however, seems to have pointed out, in the characters of the head, sufficient distinguishing marks. " In all the specimens of Typhle (he adds), which we have examined, the snout is large, broad, and subcompressed on the sides. It passes from the crown of the head, which is flat, to the mouth, in a straight line, or with very little sinuosity; instead of which, in *Acus*, the outline from the nape over the crown of the head, rises conspicuously, then takes a curvature over the eye, and slopes considerably over the base of the snout." Dorsal-fin 41, pectoral 12, anal 3, and caudal 12 rayed.

b b No anal fin.

36. S. *pelagicus.*—Body linear, heptangular.

Linn. Syst. i. 416. *Don.* Brit. Fishes, tab. 58.—Caught in the winter season, among sprats, on the English coast.

Length about 6 inches. Body brown, with transverse dark bands. Dorsal fin 23, pectoral 14, and caudal 10 rayed. Donovan first recorded this species native of the British Seas.

a a No caudal or anal fin.

37. S. *barbarus.*—Body hexangular; tail quadrangular.

Linn. Syst. i. 417. *Penn.* Brit. Zool. iii. 138. *Low*, Hist. Ork. 179.—Not uncommon.

Length about a foot. Colour olive-brown, with numerous transverse bluish lines. Snout compressed. Angles of the body blunt. Dorsal-fin 40, pectoral 12, rayed.

II. *Destitute of pectoral, anal, or caudal fins.*

38. S. *æquoreus.*—Snout long. Body octangular; the dorsal and ventral ridges acute.

Acus nostras cauda serpentina, *Sibb.* Scot. 24. tab. xix. Syn. æq. *Linn.* Syst. i. 417. *Mont.* Wern. Mem. i. 85. tab. iv. f. 1.—Rare.

Length upwards of 20 inches. Colour yellowish, with transverse pale lines. From the head to the vent of equal size; from the vent to the tail tapering and round. Three-fourths of the dorsal-fin before the ventral aperture; of 40 rays.—This species, obviously pointed out by Sibbald as an inhabitant of the Frith of Forth, was more clearly characterized by Montagu from specimens taken at Salcomb.

39. S. *Ophidion.*—Snout short. Body round. Skin smooth.

Acui Aristotelis congener pisciculus, *Will.* Ich. 160.—S. oph. *Linn.* Syst. i. 417.—Little Pipe-Fish, *Penn.* Brit. Zool. iii. 141.—Not uncommon.

Length about 5 inches. Colour olive. Snout short. The lower jaw turns suddenly up, with a protuberance at the bend.—The other species of pipe fish hatch their young internally, and they escape by the rending of the skin of the belly; but, in this species, the eggs, which are yellow, are excluded, arranged in rows, and attached externally to a long groove in the belly.

According to information communicated to Mr Pennant, the Hippocampus vulgaris has been found on the southern shores of the kingdom.—Brit. Zool. iii. 141.

MALACOPTERYGIOUS FISHES.

I. *Furnished with ventral fins.*

- *a.* Ventrals abdominal, or situate between the pectorals and the vent.
  - *b.* Upper jaw formed by the intermaxillary and maxillary bones.
    - *c.* Two dorsals, the last fleshy and destitute of rays. **Salmonidæ.**
      - Salmo.
      - Osmerus.
      - Coregonus.
    - *cc.* One dorsal fin. Intermaxillaries narrow and short; maxillaries protrusile. Belly compressed. **Clupeadæ.**
      - Clupea.
      - Encrasicholus.
  - *bb.* Upper jaw formed by the intermaxillaries.
    - *c.* Mouth wide, with strong teeth. **Esocidæ.**
      - *d.* Dorsal and ventral fins entire.
        - Esox.
        - Belone.
      - *dd.* The last rays of the dorsal and ventral fins detached, forming spurious fins.
        - Scomberesox.
    - *cc.* Mouth small; teeth minute. **Cyprinidæ.**
      - *d.* Lips simple.
        - *e.* Dorsal fin with a spinous ray.
          - Cyprinus.
          - Barbus.
        - *ee.* Dorsal fin destitute of spinous rays.
          - *f.* Mouth with a beard. The dorsal and anal fins short.
            - Gobio.
            - Tinca.
          - *ff.* Mouth beardless.
            - Abramis.
            - Leuciscus.
      - *dd.* Lips fleshy, fit to act as a sucker.
        - Gobitis.
- *aa.* Ventrals, thoracic or jugular; *i. e.* situate directly under, or nearer the head than the pectorals.
  - *b.* Sides of the body similar. An eye on each side.
    - *c.* Breast furnished with a sucker.
      - *d.* Sucker double.
        - Lepadogaster.
      - *dd.* Sucker single.
        - Liparis.
        - Cyclopterus.

cc. Breast destitute of a sucker; and the head covered with a naked skin or minute scales. GADUSIDÆ.

d. Bearded.

e. Three dorsal, and two anal fins.
Morhua.

ee. Two dorsal, and one anal fins.
f. The first dorsal fin developed and entire.
Molva.
Physcis.

ff. The first dorsal fin imperfect, the rays short.
Gadus.
Raniceps.

dd. Beardless.
e. Two dorsal fins.
Merlangus.
Merluccius.

ee. One dorsal fin.
Brosmus.

bb. Sides of the body dissimilar. Eyes on one side. PLEURONECTIDÆ.

c. Dorsal fin reaching to the mouth, and, with the anal, nearly continuous with the tail.
Pleuronectes.
Solea.

cc. Dorsal fin reaching only to the eye, and, with the anal, disjoined from the caudal.
Platessa.
Hippoglossus.

II. *Destitute of ventral fins.*

a. Gill-opening small, and the gill-cover concealed by the skin.
Anguilla.
Leptocephalus.

aa. Gill-opening and gill-lid apparent.
Ophidium.
Ammodytes.

GEN. XXI. SALMO. SALMON.—The first dorsal fin as near the head as the ventrals. Teeth strong, numerous. Gill-flap of more than eight rays. Under-jaw of the males turned up.

1. Tail forked.
a. Migratory from the sea.

40. S. *Salar.* Common Salmon.—Upper jaw longest; teeth on the vomer; anal fin with about thirteen rays.

S. *Merr.* Pin. 188. *Sibb.* Scot. 24. *Will.* Ich. 189.—Salmo rostro ultra inferiorem maxillam sæpe prominente, *Artedi*, Ich. Syn. 22.—S. Salar, *Linn.* Syst. i. 509. *Penn.* Brit. Zool. iii. 284.—*W*, Gleisiedyn, Eog, Maran Taliesin; *G*, Bradan.—In the sea and rivers.

This fish seldom exceeds 3 feet in length, and weighs from 10 to upwards of 70 pounds in weight. The back is of a bluish-black colour, passing into grey and white on the sides and belly, more or less spotted above the lateral line. The following is the ordinary number of rays in the fins,—D. 14, P. 14, V. 10, A. 13, C. 21. Salmon leave the sea, and ascend the rivers throughout the summer season. Having reached the suitable station, they pair, and, in company, proceed to excavate a furrow, in the gravelly bed of the shallow or running water at the top or bottom of the deeper pools. Into this furrow the milt and roe are simultaneously deposited, and covered. This operation occupies nearly a fortnight. The eggs sometimes amount to 20,000. When the fish have spawned, or become kelts, they betake themselves to the deep pools, and then proceed to the sea, the males commencing the journey earlier than the females. Their favourite food in the sea is the sand-eel. The fry leave the spawning-groove about March, retire to pools, and proceed, according to circumstances, in myriads along the easy water at the margin of the river, with their heads against the stream, until they reach the tide in the estuary, where, like the kelts, which frequently go down at the same time, they retire to the deepest part of the channel, and disappear in the sea. These samlets, smoults or smouts, are regarded by many as reappearing in the estuaries a few months afterwards in the character of *grilses*, of from 3 to 9 pounds weight, according to the lateness of the season. The reader who wishes to obtain accurate information regarding the habits of this species, its economical and commercial value, may consult with advantage the "Reports from the Select Committee (of the House of Commons) on the Salmon Fisheries of the United Kingdom," in 1824 and 1825, and the Edin. Phil. Journ. No. xxiv. p. 335. *et seq.*

41. S. *Hucho.* Bull-trout.—Upper-jaw longest. No teeth in the vomer; anal-fin with about ten rays.

Trutta fluviatilis Huch Germannis dicta, *Will.* Ich. 197, and the Scurf, ib. 193.—S. H. *Bloch.* Ich. tab. 100.—In the sea and rivers.

This species is little inferior to the salmon in size. Its shape is more lengthened. The colour nearly the same. The flesh white and insipid. In the upper-jaw there is a single row of teeth on the maxillaries, intermaxillaries, and palatines, but none in the middle on the vomer. A single row of teeth on the lower-jaw. The tongue with a row of teeth on each side. The rays of the fins of one which I examined were B. 11, D. 13, P. 14, V. 10, A. 10.

42. S. *albus*. Phinock.—Jaws nearly equal; teeth numerous, recurved.

White, *Penn.* Brit. Zool. iii. 302. Whitling, Hirling.—Common in the sea and rivers of Scotland, and the north of England.

This species seldom reaches a foot in length. The back is nearly straight. The colour, above, greyish-black; the belly silvery-white. The scales small. The caudal-fin is black, and the pectorals yellowish towards their extremities, B. 11, D. 12, P. 14, V. 9, A. 9, C. 24. The flesh has a reddish tinge. This species leaves the sea about July. It is seldom taken by nets in estuaries, though numerous in the rivers which it frequents, for the purpose of spawning, in August and September. It seems to have been first described by Pennant, and is probably the Salmone Cumberland of Lacepede.

bb. Stationary in fresh water.

43. S. *salvelinus*. Torgoch.—The first rays of the ventral and anal fins white. Belly scarlet.

Umbla minor Gesneri, Torgoch and Red Char. *Will.* Ich. 197.—Red Char, and Gilt Char. *Penn.* Brit. Zool. iii. 309.—S. salvelinus, *Bloch*, Ich. tab. xcix. *Don.* Brit. Fishes, tab. cxii.—*G*, Tarrag-heal.—In the alpine lakes of Wales and Scotland.

Length about a foot. Back purplish-blue, passing into silvery-yellow and scarlet on the sides and belly; with red spots. D. 11, P. 13, V. 9, A. 11, C. 24. The flesh is red.—Spawning season about January.

44. S. *alpinus*. Case Char.—First rays of the ventral and anal fins plain. Belly fulvous.

Penn. Brit. Zool. iii. 308. *Bloch.* Ich. tab. civ. *Don.* Brit. Fishes, tab. lxi.—In the lake Winander Mere, Westmoreland.

Length about a foot. Back black, sides blue; belly fulvous, with pale red spots. D. 11, P. 16, V. 11, A. 10. C. 24. Spawns at Michaelmas.—Though the observations of Donovan have advanced considerably the history of this species and the Torgoch, there is yet wanting a more complete elucidation of their characters and manners.

2. Tail nearly even.
a. Migratory from the sea.

45. S. *Trutta*. Sea-Trout.—Gill-flap with nine rays. Jaws nearly equal.

Salmoneta, *Sibb.* Scot. 25.—Trutta salmonata, *Will.* Ich. 198.—S. trutta, *Linn.* Syst. i. 509. *Penn.* Brit. Zool. iii. 296.—In the sea and rivers, common.

Length about 18 inches; weight about 3 pounds. Colour, above, greenish-black, beneath silvery, sides with irregular purplish-black spots. D. 13, P. 13, V. 10, A. 11, C. 32. The flesh is red, especially in those which have the palate dark coloured. The migrations of this species nearly similar to the salmon. The Samlet or Par of Pennant, *Brit. Zool.* iii. 303., is now generally considered as the young of this species or the salmon, and is distinguished by the row of vertical bluish spots on each side.

46. S. *Eriox*. Grey.—Gill-flap with eleven rays; the upper-jaw shortest.

Will. Ich. 193.—S. Eriox, *Linn.* Syst. i. 509. *Penn.* Brit. Zool. iii. 195.—S. Cambricus, *Don.* Brit. Fishes, tab. xci.—In the sea and rivers.

Length from 18 to 24 inches; weight from 3 to 6 pounds. Colour, above, dusky-green, with numerous large, subcruciform spots. Belly silvery, the sides frequently with a yellow tinge. The head is large and blunt, and the body tapers little behind the tail. The tongue usually with 5 teeth on each side. D. 13, P. 13, V. 10, A. 10, C. 40.—This fish differs from the former n the clumsiness of its shape, its larger and more numerous spots; in the mouth having more teeth; and in the lateness of its migration from the sea. The sea-trout enters rivers in the spring and summer months, while the grey is seldom observed before the end of July. I have taken four young herrings from its stomach, each upwards of 3 inches in length.

aa Stationary in rivers.

47. S *Fario.* Common Trout.—Body with red spots on the lateral line. Tail slightly forked.

Trutta fluviatilis, *Sibb.* Scot. 25. *Will.* Ich. 199.—S. F. *Linn.* Syst. i. 509. *Penn.* Brit. Zool. iii. 297.—*W*, Brithyll; *G*, Breac.—In rivers and lakes.

Length about a foot. Colour, dusky above, with purple and red spots; beneath grey. Head blunt. D. 13, P. 13. V. 9, A. 9, C. 25. Flesh white. Devours the eggs of the salmon. When it feeds on shell-fish, as the Gillaroo Trout of Galway (Phil. Trans. lxiv. p. 116.—Sowerby, *Brit. Misc.* tab. lxi.), the coats of the stomach acquire a thickness like the gizzard of birds.—In the river Eynion in Cardiganshire, the trout are crooked, immediately above the tail.

GEN. XXII.—OSMERUS. SMELT.—The first dorsal fin placed more remote from the head than the ventrals. Gill-flap of eight rays.

48. O. *Eperlanus.*—Lower jaw longest; back greenish-white, sides varied with blue, belly silvery; head translucent.

Experlanus, *Merr.* Pin. 188.—Eperlanus, *Will.* Ich. 202.—Osmerus radiis pinæ ani septendecem, *Artedi*, Ich. Syn. 21.—Salmo Ep. *Linn.* Syst. i. 511. *Penn.* Brit. Zool. iii. 313.—S. Spirlin.—In the sea and estuaries.

Length from 9 to 12 inches. Tail forked; scales small, deciduous. D. 11, P. 12, V. 8, A. 14, C. 19. Emits a particular scent, which has been compared to violets, cucumbers or rushes. This fish enters the estuaries from the sea in the beginning of winter, spawns in March, near the junction of the river with the salt water. In the Tay its principal food is the shrimp.

GEN. XXIII. COREGONUS.—Minute teeth on the jaws, none on the tongue or palate. Tail forked.

49. C. *Thymallus.* Grayling. — Scales in regular rows; grey, with longitudinal dusky blue lines.

Umbra fluviatilis, *Merr.* Pin. 189.—Thymallus, *Will.* Ich. 187.—Cor. maxilla superiore longiore, pinna dorsi ossiculorum viginti trium, *Art.* Ich. Syn. 20.—Salmo Th. *Linn.* Syst. i. 512. *Penn.* Brit. Zool. iii. 311. *Don.* Brit. Fishes, tab. lxxxviii.—In the sea, and clear and rapid streams.

Length from 10 to 18 inches. Head obtuse; the upper jaw longest. D. 18, P. 12, V. 11, A. 11, C. 19. The second ray of the pectorals strong and produced. At certain seasons said to smell like thyme. Leaves the sea early in spring, and ascends clear and rapid streams to spawn; returning again before winter. According to Mr Low, (Ork. 224.) “ This species is found very frequent with us; caught with a fly, to which it rises very freely, and struggles hard for life. Swims very quick; leaps much, especially when struck with a hook.”

√ 50. C. *Lavaretus*. Gwiniad.—Scales large; above blue; beneath silvery. Upper lip prominent.

> Poana, Vandesius et Gevandesius, *Sibb.* Scot. 20.—Guiniad, *Will.* Ich. 183.—Cor. maxilla superiore longiore plana, pinna dorsi ossiculorum quatuordecem, *Art.* Ich. Syn. 19.—Salmo Lav. *Linn.* Syst. i. 512. *Penn.* Brit. Zool. iii. 316.—*S*, Vendice; *W*, Guinead Powan; *G*, Pollag.—In lakes.

Length about a foot. Mouth resembling that of a herring. Jaws equal. Gill-covers silvery, powdered with black. Belly flat. D. 14. p. 18. (the first the longest) v. 12. (of a deep blue colour). A. 15. Belly flat. Gregarious. Spawns in December.—This fish occurs in the lakes of Cumberland and Wales, in England; in Loch Neagh in Ireland; and in the Castle Loch, Lochmaben, (Stat. Acc. vii. 236), Loch-eik in Strachur, (ib. iv. 557.), Lochlomond, (ib. xvii. 248.), in Scotland. It is the Coregone Clupeoide of Lacepede.

* * *

Before concluding this enumeration of the British Salmonidæ, the fish which Pennant has referred to the Linnean genus Argentina, under the title Sheppy Argentine, requires to be noticed. It is thus described, “ A little fish, which I believe to be of this species, was brought to me, in 1769, taken in the sea near *Downing*. The length was 2¼ inches; the eyes large; the irides silvery. The lower jaw sloped much; teeth small. The body compressed, and of an equal depth almost to the anal fin. The tail forked. The back was of a dusky green. The sides and covers of the gills as if plated with silver. The lateral line was in the middle, and quite straight. On each side of the belly was a row of circular punctures: above them another, which ceased near the vent.”—Brit. Zool. iii. 327. The Reverend Mr Low refers to a fish which he considers as similar to the one described by Pennant, which was once brought to him in Orkney. “ It was not above an inch in length; seemed very delicate; the colours good; the back greenish, spotted with darker clouds; the belly a fine silver; but it lost all its fine colours when kept dry. All the fins were soft; and the tail-membrane, as well as those of the other fins, was very thin.”—Ork. 225. The fish referred to by Pennant is regarded by Cuvier (Regne Animal, ii. 169), as belonging to his genus Scopelus, which differs from Argentina in the mouth and gill-opening being larger, and in the tongue and palate being smooth. He considers it, and with some probability, as identical with S. Humboldti, the *Serpe Humboldt* of Risso, Ich. 358. tab. x. f. 38.

Gen. XXIV. CLUPEA. Herring.—Maxillaries bent outwards. Belly compressed, serrated.

√ 51. C. *Harengus*. Common Herring.—Anal fin about 17 rayed; the dorsal fin placed behind the centre of gravity.

> Harengus, *Merr.* Pin. 185. *Sibb.* Scot. 23. *Will.* Ich. 219.—Clupea maxilla inferiore longiore, maculis nigris carens, *Art.* Ich. syn. 14.—C. Har. *Linn.* Syst. i. 522, *Penn.* Brit. Zool. iii. 335.—Common on the coast.

Length about a foot. Dusky green above; silvery beneath. Scales deciduous. D. 17. P. 17. v. 9.—Inhabits the deep water. When the spawning season approaches, herrings are found near the shore, in bays and estuaries. Their migrations to and from the Arctic Circle, given in detail by Pennant, have no existence in nature. The fry or *sill* enter the mouths of rivers, and have even been caught with a trout-fly.

52. C. *Pilcardus.* Pilchard.—Anal fin about 17 rayed. The dorsal fin placed in the centre of gravity.

Alosa minor, *Merr.* Pin. 185. *Sibb.* Scot. 23.—Harengus minor, *Will.* Ich. 223. *Penn.* Brit. Zool. iii. 343; *S*, Crue-herring.—Common on the Cornish coast; rare in Scotland.

Length about a foot. The body is rounder than in the herring; the snout and under jaw shorter; back more elevated; and the scales larger. D. 18. P. 16. v. 8, c. 32.—This fish appears in vast shoals off the Cornish coasts, about July. Like the herring, however, they are capricious in their movements.

The fry of the herring and pilchard are confounded together under the epithet *Sprat.* The position of the dorsal fin, in reference to gravity, furnishes, however, an obvious mark of distinction.

53. C. *Alosa.* Shad.—Snout bifid. The mucous ducts on the gill-covers elegantly branched.

Alosa seu Clupea, *Merr.* Pin. 190. *Will.* Ich. 227.—C. Alosa, *Linn.* Syst. i. 523. *Penn.* Brit. Zool. iii. 348. *Flem.* Phil. Zool. tab. iii. f. 1.—*E*, Mother of Herrings; *S*, Elf Herring.—In the sea and large rivers.

Length about 18 inches. Above greenish-black; sides and belly silvery. The under jaw longest. D. 20. (the first four short and simple) P. 16. v. 9. A. 21. Tail greatly forked, and on each side a large scale, with its mesial edge free. I have taken fine young herrings, about 3 inches in length, from the stomach of this fish. The shad leaves the sea in May, and enters the rivers for the purpose of spawning. It is not unfrequently taken by the salmon-nets. The fry is well known in the Thames by the name of White Bait, appearing near Blackwall and Greenwich during the month of July.

GEN. XXV. ENCRASICHOLUS. ANCHOVY.—Maxillaries long and straight. Belly smooth.

54. E. *Encrasicolus.*—Dorsal and ventral fins opposite.

Will. Ich. app. 27. *Ray*, Syn. Pisc. 107.—Clupea En. *Linn.* Syst. i. 523. *Penn.* Brit. Zool. iii. 347. *Don.* Brit. Fishes, tab. 4.—In the sea and a few of the English rivers.

Length about 6 inches. Back green, semi-pellucid; sides and belly silvery. Upper jaw produced. D. 15, P. 15, v. 7, A. 14, C. 24. Considerable quantities are imported from the Mediterranean, in a pickled state.

The claims of the *Lepisosteus osseus* (which may readily be recognized by the osseous scales with which it is protected), to rank as a British fish, are very doubtful. Berkenhout inserts it in his Synopsis, p. 81. with the habitat *Sussex coast;* and Stewart, in his Elements, vol. i. 374. intimates its occurrence in the Frith of Forth.

GEN. XXVI. ESOX. PIKE.—Snout oblong, rounded, depressed. The intermaxillaries, vomer, and palate-bones, armed with teeth.

55. E. *Lucius.* Common Pike.—Body olive above, with yellow spots; beneath white, with black spots.

Lucius, *Merr.* Pin. 190. *Sibb.* Scot. 25. *Will.* Ich. 236.—E. Lucius, *Linn.* Syst. i. 516. *Penn.* Brit. Zool. iii. 320.—*E*, Pickerel, Sul.; *S*, Ged.; *W*, Penhwyad; *G*, Geat-iasg.—In lakes and pools. Common.

This fish grows to a great size. Pennant states, that the largest he ever heard of in England weighed 35 pounds. Dr Grierson mentions one taken in Loch Ken in Galloway, which weighed 61 pounds (Thomson's Annals of Philosophy, vol. iii. p. 428). Body nearly of equal thickness, suddenly decreasing behind the dorsal and anal fins. D. 21, P. 15, v. 2. A. 18. Exceedingly voracious. I have found their own fry, an inch and a half long, in their stomach, in the month of July. They spawn in February or March. According to the observations of the Reverend Revett Sheppard, a migration of pikes "takes place yearly in spring, in the Cam, up which river they come in great shoals, doubtless from the fens in the neighbourhood of Ely, where they are bred."—Linn. Trans. xiv. 587. There is abundant evidence that the pike is indigenous, though considered by some as having been introduced into England in the reign of Henry VIII. in 1537.

GEN. XXVII. BELONE. GAR.—Snout produced. Teeth confined to the intermaxillaries. Scales on each side of the belly carinated.

56. *B. vulgaris.* Common Gar.—Body green above, white below.

Acus vulgaris, *Will.* Ich. 231.—Esox Belone, *Linn.* Syst. i. 517.—Gar Pike, *Penn.* Brit. Zool. iii. 324. *Don.* Brit. Fishes, tab. 64.—On various parts of the coast.

Length from 12 to 18 inches. Body nearly cylindrical. The belly flat. Jaws slender, armed with fine teeth; the lower jaw longest. D. 17, P. 13, v. 7, A. 19, C. 23. Leave the deep water in spring, to spawn near the shore. Bones become green by boiling. The fish to which Mr Couch refers as probably the *Esox Braziliensis* of *Linné*, seems to be the young of this species.—Linn. Trans. vol. xiv. p. 85.

GEN. XXVIII. SCOMBERESOX. SAURY.—Teeth confined to the intermaxillaries. Belly bicarinated.

57. *S. Saurus.* Saury.—Jaws subulate, waved, subrecurved; the lower jaw longest.

Skipper, *Will.* Ich. 232. *Ray*, Syn. Ich. 165. *Borl.* Corn. 271.—Saury, *Penn.* Brit. Zool. iii. 325. *Rackett*, Linn. Trans. vii. p. 60. *Don.* Brit. Fishes, tab. cxvi.—*S*, Gowdnook, Egyptian Herring.—On the coast, not rare.

Length from 12 to 18 inches. Body slender; back changeable green; belly silvery. Scales small. Tail greatly forked. Finlets six above and six below, but apt to vary in number. D. 11, P. 11, v. 6, A. 11, c. 22.—This fish is gregarious; and, in the autumn, runs up the estuaries, and frequently does not, like other fishes, retire from the shallows with the ebbing of the tide, but is found with the long snout stuck in the mud. It sometimes leaps out of the water, and passes over a space of 30 or 40 feet.

A single example of the Exocetus *volitans*, or Flying Fish, was caught at a small distance below Caermarthen, in the river Towy, in June 1765, the account of which was communicated to Pennant by John Strange, Esq., Brit. Zool. iii. 333. Another in July 1823, ten miles from Bridgewater, in the Bristol Channel, a notice of which was communicated to the Linnean Society, by the Reverend S. L. Jacob.—Annals of Phil. vol. xxii. 152. It is not, however, recorded in the " Extracts" of the Society, in vol. xiv. p. 582.

Before proceeding to the indigenous species of the family of Cyprinedæ, three naturalized species merit some notice, belonging to the restricted genus

CYPRINUS. Carp.—Dorsal fin long. The second ray of the dorsal and anal fin a serrated spine.

1. *C. Carpio.* Common Carp.—Mouth with four beards; lateral line bent; tail forked.

The carp appears to be a native of the southern lakes and ponds of Europe. It is usually stated to have been first introduced into England, by Leonard Maschal, about the year 1514, though, according to the testimony of Wynkyn de Worde, a few were in England about twenty years previous. It is tenacious of life, prolific, and prized as food.

2. *C. auratus.* Golden Carp.—Mouth without a beard. Tail forked, often 3 or 4 parted.

This truly beautiful fish, so rich in colour, the body being often golden, the fins scarlet, is a native of China, where it is kept in porcelain vessels in the houses of the rich, for ornament, and for the amusement of the ladies. It was introduced into England about the year 1691, where it breeds freely.

3. C. *Gibelio.* Gibel.—Without a beard. Tail crescent-shaped. Dorsal fin with 19 rays.

This seems to be the Crusian of the British Zoology, as stated on the authority of the late Mr Dryander, in the last edition. Indeed the figure originally given bears so close a resemblance to the Cyprinus Gibelio of Bloch, Ich. tab. xii. while it differs from the C. carasius, as to leave no room to doubt that Mr Pennant was originally misled in his inference. He says that this fish is found in many of the ponds in the neighbourhood of London. He considers it as a naturalized species, but that the period of its introduction is uncertain.

Gen. XXIX. BARBUS. Barbel.—Dorsal fin short. The second or third ray spinous.

58. *B. vulgaris.* Common Barbel. Mouth with four beards. Form produced.

Barbus, *Merr.* Pin. 189. *Will.* Ich. 259.—Cyprinus oblongus, maxilla superiore longiore, cerris quatuor, pinna ani ossiculorum septem, *Art.* Ich. Syn. 8.—C. Barbus, *Linn.* Syst. i. 525. *Penn.* Brit. Zool. iii. 357. *Don*, Brit. Fishes, tab. xxix. Gregarious.—In the English rivers.

Length from 2 to 3 feet. Body usually olive on the back, and silvery on the belly. D. 11, P. 13, V. 11, A. 9, c. 22. The second or spinous ray of the dorsal fin strongly serrated on both sides. Spawns in April. Flesh and eggs supposed by some to be hurtful, an opinion which Bloch refuted from experience.

59. *B. orfus.* Rud.—Mouth without beard. Body deep.

Rutilus latior, Rudd, or Tinscale, *Will.* Ich. 252—C. or. *Linn.* Syst. i. 530. *Rud*, Penn. Brit. Zool. iii. 363.—C. orfus, *Bloch*, Ich. tab. xcvi.—In the English rivers.

Length from 12 to 16 inches. Body deep and thick. Head small. Irides yellow. Scales large. Back olive; sides and belly of a gold colour; ventral, anal. and caudal fins red. D. 10. (the first short, the second spinous, and slightly serrated). P. 19. (the first large), V. 9. A. 13. Spawns in April.—This fish, according to Willoughby, is found in the lakes and rivers of Yorkshire, Lincolnshire, and Oxfordshire. Pennant and Bloch, inconsiderately refer this species, so well described by Willoughby, to the Erythropthalmus of Linnæus, which is also the erythropthalmus of our venerable ichthyologist. The serrated spinous ray of the dorsal fin has induced me to place it here along with the Barbel, from which, however, it seems to differ, generically, in shape, and the absence of a beard. It may be termed, after Willoughby, RUBELLIO *fluviatilis*.

GEN. XXX. GOBIO. GUDGEON.—Tail forked. Upper jaw longest.

60. *G. fluviatilis.* Common Gudgeon.—A single beard at each corner of the mouth.

Merr. Pin. 189.—Gobius fluv. *Will.* Ich. 265.—Cyprinus Gobio, *Linn.* Syst. i. 526. *Penn.* Brit. Zool. iii. 361. *Don*, Brit. Fishes, tab. lxxi.—Found in gentle streams in England.

Length 6 inches. Body round. Back dusky. Belly white. A row of large black spots on the sides. D. 8, P. 14, V. 8, A. 11, C. 21. In winter, the gudgeon congregates in deep pools or lakes. In summer, frequents shallows. Flesh highly esteemed.

GEN. XXXI. TINCA. TENCH.—Tail thick, even. Scales minute, slimy.

61. *T. vulgaris.* Common Tench.—The back, dorsal, and ventral fins dusky; the head, sides, and belly yellowish-green.

Tinca, *Merr.* Pin. 190. *Will.* Ich. 251.—Cyprinus Tinca, *Linn.* Syst. i. 526. *Penn.* Brit. Zool. iii. 359. *Don*, Brit. Fishes, tab. cxiii.—In lakes and rivers, England.

Weight 4 or 5 pounds. Body thick in proportion to its length. A minute beard at each side of the mouth. Gape ascending. D. 11, P. 17, V. 9, A. 10. Willoughby states that the tench spawns when the wheat is in flower. Flesh insipid.

Gen. XXXII. ABRAMIS. Bream.—Anal fin long; the dorsal fin short, and behind the ventrals.

62. *A. Brama.* Common Bream.—Lateral line placed low, and waved irregularly.

Cyprinus latus (Abramus) *Merr.* Pin. 190. *Will.* Ich. 248.—Cyprinus Brama, *Linn.* Syst. i. 531. *Penn.* Brit. Zool. iii. 362. *Don*, Brit. Fishes, tab. xciii.—In lakes or deep rivers; England and Scotland.

Weight 4 or 5 pounds. Body deep, compressed; the head small, and the back elevated and sharp. Back bluish black; the sides and belly white; the latter sometimes yellow or red. Scales large. Mouth remarkably small. D. 11, (the second ray the longest), p. 19, v. 9, a. 27. (crescent-shaped). Spawn in May. Willoughby adds, "Hepar habet longum inter ventriculum et intestinum, in ipsa flexura eodem modo depositum quo *pancreas* in avibus. Cystis fellea in hepatis parenchymate pene latitat. Lien ei angulosus; appendices nullæ; intestina semel reflexa. Vesica pneumatica transversim in duos lobos divisa." According to the Reverend Revett Sheppard, "There exist in the river Trent, in the neighbourhood of Newark, two species or varieties of bream. The common one *Cyprinus Brama* is known there by the name of Carp Bream, from its yellow colour, and has been taken of nearly 8 pounds weight. The other species or variety, which I believe to be a nondescript, never exceeds a pound in weight. It is of a silvery hue, and goes by the name of White Bream."—Linn. Trans. xiv. p. 587. According to Pennant, the bream occurs in Lochmaben.—*Lightfoot's Flora Scotica*, i. 63.

Gen. XXXIII. LEUCISCUS.—Dorsal and anal fins short.

* *Ventral and anal fins reddish.*

63. *L. vulgaris.* Dace.—Body oblong; slightly compressed. Head small. Irides pale yellow.

Leuciscus, *Merr.* Pin. 189. *Will.* Orn. 260.—Cyprinus Leuciscus, *Linn.* Syst. i. 528. *Penn.* Brit. Zool. iii. 366. *Don*, Brit. Fishes, tab. lxxvii.—*E*, Dar, Dart.—In rivers in England.

Length about 10 inches. Back dusky green; sides and belly silvery. Dorsal fin dusky; the ventral, anal, and caudal fins red. D. 10, p. 15, v. 9, a. 9. Tail much forked. Spawns in February. Lurks near the roots of trees; frolicksome. Flesh insipid. The *Graining* of Pennant, *Brit. Zool.* iii. 367; (the Cyprinus Lancastriensis of Shaw, Gen. Zool. v. 234), is usually considered as a variety of the dace. It is thus described: "The graining is found in the Mersey, near Warrington; has much the resemblance of a dace, but is more slender, and the back straiter. The usual length about 7½ inches. The depth to the length of this is as one to five; of the dace as one to four. The colour of the back is silvery, with a bluish cast. The eyes, ventral, and anal fins are red, but paler than those of the dace. The pectoral fin redder."

64. L. *cephalus.* Chub.—Body and head thick; snout rounded. Scales large, angular.

Capito sive cephalus, a Chub or Chevin, *Will.* Ich. 255.—Gyprinus oblongus macrolepidotus: pinna ani ossiculorum undecim, *Art.* Ich. gen. v. syn. 7.—Cyprinus Cephalus, *Linn.* Syst. i. 527. *Penn.* Brit. Zool. iii. 368.—Cyprinus Jeses, *Don.* Brit. Fishes, t. cxv.—In rivers in England and Scotland.

Length 15 inches. Back dusky green; sides and belly silvery. Mouth small, the lower jaw shortest. Nostrils large. D. 9, P. 17, V. 9, A. 11. Spawns in May in sandy places in the middle of the stream. Lurks near the roots of trees in running water. Linnæus, by mistake, states that the tail of this fish is entire. Bloch, when describing his Le Villian, or C. *Jeses*, adds, "Pennant se tromp, quand il croit que le cephale de Linné est son chub; car la figure de la nageoire de la queue, et le nombre des rayons dans la nageoires de l'anus prouvent que ce sont deux poissons differens," Ich. tab. vi. Had this author traced the chub of Pennant to the pages of Willoughby, and compared the minute description of the latter with the characters given of the C. *cephalus* by Artedi and Linné, he never would have referred our fish to the *Jeses* of Linné, which is the *Capito cœruleus* of Willoughby. According to Pennant, the Chub is found in the Annan.—*Lightfoot's Flora Scotica*, i. 63.

65. L. *rutilus*. Roach.—Dorsal fin with 10 rays; body deep compressed.

Rutilus sive Rubellus, *Merr.* Pin. 190. *Will.* Ich. 262.—Cyprimus Rutilus, *Linn.* Syst. i. 529. *Penn.* Brit. Zool. iii. 365. *Don.* Brit. Fishes, t. lxvii.—*S*, Braise.—In rivers and lakes in England and Scotland.

Length about 1 foot. Back dusky-green; sides and belly silvery. Scales broad, striated. P. 13, V. 9, A. 12, C. 22.—Spawns in spring.—Willoughby considers the Roach as a lake fish, occasionally entering rivers. The Reverend David Ure (Author of the History of Rutherglen and Kilbride), when describing the Roach, in the parish of Killearn, says, "Vast shoals come up from Loch Lomond, and by nets are caught in thousands: their emigrations from the loch, however, are only for the space of three or four days about the end of May."—*Stat. Ac.* xvi. p. 109.

66. L. *erythropthalmus*. Red Eye.—Dorsal fin with 14 rays. Irides red; body deep, compressed.

Erythropthalmus, *Will.* Ich. 249.—Cyprinus Eryth. *Linn.* Syst. i. 530. *Bloch*, Ich. t. i. *Don.* Brit. Fishes, t. xl.—In England.

Length about 10 inches. Back dusky green; sides and belly silvery. P. 15, V. 9, A. 13.—Spawns in April.—This species claims to rank in the British Fauna, on the authority of Donovan, who has neglected to state the locality from whence his specimen was procured, and who considered it as the Rud. Willoughby, however, adds, "ab *orfo* distinguitur, 1. Pluribus in pinna dorsali radiis; 2. Macula crocea sub lingua; 3. Volutis intestinorum."

** *Ventral and anal fins plain.*

67. L. *alburnus*. Bleak.—Body slender, compressed; under-jaw longest; fins pellucid.

Alburnus, *Merr.* Pin. 190. *Will.* Ich. 263.—Cyprinus alb. *Linn.* Syst. i. 531. *Penn.* Brit. Zool. iii. 370. *Don.* Brit. Fishes, t. xviii.—*E*, Bleik, Bleis.—In rivers in England.

Length about 6 inches. Back green; sides and belly silvery; scales deciduous; the lateral line twice bent. D. 10, P. 16, V. 9, A. 19.—Spawns in May.—The silvery scales of this species are used by artists in the manufacture of artificial pearls. Sibbald inserts this species as a native of Scotland: "Alburnus, an qui nostratibus the Bleis."—*Scott. Ill.* 25.

68. L. *Phoxinus*. Minnow.—Body rounded; back depressed; scales minute. Jaws equal.

Phoxinus, *Merr.* Pin. 190. *Sibb.* Scot. 25.—Cyprinus Phoxinus, *Linn.* Syst. i. 528. *Penn.* Brit. Zool. iii. 373. *Don.* Brit. Fishes, t. lx.—*E*, Pink, Minim.—In rivers, common.

Length about 3 inches. Colour various; usually the back is dusky olive, the belly white. D. 8, P. 14, V. 8, A. 8, C. 19, marked at the base with a dark spot.—This fish, well known to young anglers, is extensively employed as a bait, in the capture of many fresh-water fishes.

According to Mr Stewart, the *Cyprinus Idus* of Linné, a species minutely described by Artedi, Ich. Disc. p. 6., was found in the mouth of the Nith by the late Dr Walker.

GEN. XXXIV. GOBITIS. LOCHE.—Lips with 6 beards. Scales small, slimy.

69. G. *barbatula*. Bearded Loche.—Sides of the head unarmed.

G. barbatus, *Merr.* Pin. 189. *Sibb.* Scot. 25.—G. fluviatilis, *Will.* Ich. 265.—G. Barb. *Linn.* Syst. i. 499. *Penn.* Brit. Zool. iii. 282. *Don.* Brit. Fishes, t. xxii.—In slow running streams.

Length about 3 inches. Body round, compressed towards the tail. Back dusky, mottled with brown, belly white. Mouth small, a beard at each corner of the mouth, and four before the nose. D. 8, P. 12, V. 7, A. 6. Spawns in April.

70. G. *Tænia*. Groundling.—A forked spine under each eye.

G. B. aculeata, *Will.* Ich. 265.—G. Tænia, *Linn.* Syst. i. 499. *Bloch* Ich. t. xxxi. f. 2. *Berk.* Syn. i. 79.—In the Trent.

Size of the preceding. Body compressed; above brown, with black spots. D. 10, P. 11, V. 7, A. 9, C. 17.—This species was introduced into the British Fauna by Berkenhout, who, after giving its residence as in lakes or ponds, adds, " also in the Trent." Turton, in his British Fauna, i. 103, states, that it is " found in the clear streams of Wiltshire with the last."

At this place it may be proper to notice a remark of Sibbald's, leading to the conclusion that the *Silurus Glanis* may have occurred in his day in some of the Scottish rivers. At the conclusion of his list of river fishes, he adds, " Silurus, sive Glanis."—*Scotia Illustrata*, p. 25.

GEN. XXXV. LEPADOGASTER. SUCKER.—Head depressed; body smooth.

71. L. *cornubiensis*. Cornish Sucker.—Snout depressed, produced, rounded; dorsal fin with 11 rays. Four cirri in front of the eyes.

Suck-fish, *Bor*, Corn. 269. t. xxv. f. 28, 29.—Jura Sucker, *Penn.* Brit. Zool. iii. 137.—Cyclopterus corn. *Shaw*, Gen. Zool. v. 397.—Cyc. ocellatus, *Don.* Brit. Fishes, t. lxvi.—Southern coast of England and Hebrides.

Length about 4 inches. Body reddish, with dusky spots. In maturity, there are two ocellated marks behind the eyes; each consisting of a large obovate spot of a deep purple, inclosed within a broad pale brownish ring, and embellished in the centre with a brilliant blue dot. P. 17, A. 10, C. 6. This species, found on rocks at low water, differs from the L. *Gouani* and L. *Balbis* of Risso. The former of these figured by Gouan, Ich. p. 177. gen. xxxiv. t. i. f. 6, 7, differs in the spots behind the eyes being crescent-shaped, and the dorsal fin having a greater number of rays.

72. L. *bimaculatus*. Bimaculated Sucker.—Snout conical; body attenuated. Dorsal fin with five rays; no cirri in front of the eyes.

Penn. Brit. Zool. iii. 397. *Mont.* Linn. Trans. vii. p. 293. *Don.* Brit. Fishes, t. lxxviii. On the English coast.

Length an inch and a half. Colour pink, with white spots; pupil blue. Behind the pectoral fin, in maturity, on each side is a purple spot, surrounded by a ring of white. P. 11, V. 4, A. 5, C. 12. This species was communicated to Pennant by the Duchess of Portland, from Weymouth. Montagu obtained it, by dredging, at Forcross in abundance, adhering to stones and old shells.

Gen. XXXVI. LIPARIS.—Body smooth, produced; dorsal and anal fins long.

73. L. *vulgaris*. Sea-snail.—Dorsal and anal fins united with the caudal. Sucker circular; the mesial ligament broad.

Liparis nostras, *Will.* Ich. app. 17. Cyclopterus Liparis, *Linn.* Syst. i. 414. Uncteous Sucker, *Penn.* Brit. Zool. iii. 135. C. L. *Don.* Brit. Fishes, xlvii. In salt-water, near the mouths of rivers; common.

Length 4 to 5 inches. Above dusky, beneath whitish; sometimes the sides and back have purple stripes. D. 36, P. 32, A. 26, C. 12. When out of the water it soon dissolves.

74. L. *Montagui*.—Dorsal, anal, and caudal fins disjoined. Sucker ovate; the mesial ligament narrow.

Cycop. Mon. *Don.* Brit. Fishes, t. lxviii. *Mont.* Wern. Mem. i. 91.—Coast of Devon.

Length 2 inches. Body rounded to the vent, compressed towards the tail; purplish-brown, with confluent spots. D. 26, P. and v. 29, A. 24, C. 12. Front of the head scalloped with six indentations.—This species has only been observed by Montagu, at extraordinary low tides, among the rocks at Milton, on the south coast of Devon.

Gen. XXXVII. CYCLOPTERUS. Lump-fish.—Body deep, with ridges of osseous tubercles; dorsal and anal fins short.

75. C. *Lumpus*.—Back sharp, elevated; belly flat.

Lumpus, *Sibb.* Scot. 24. *Will.* Ich. 208.—Cyc. L. *Linn.* Syst. i. 414. *Penn.* Brit. Zool. iii. 133.—*E*, Lump, Sea Owl; *S*, (male) Cock Padle, (female) Hen Padle, Hush, Bagaty.—Common on the coast.

Length about 18 inches. Back dusky, belly and iridis red. Skin rough; seven ridges of tubercles. D. 11, P. 20, A. 10, C. 12. Flesh coarse and oily; seldom used as food.

◆

A single instance of the *Echineis Remora* occurring on our coast, is recorded by Dr Turton, in his British Fauna, p. 94, where he states, that one was "taken by the author in Swansea, from the back of a codfish in the summer of 1806."

Gen. XXXVIII. MORHUA. Cod.—Fins large; body tapering retrally. A single beard on the lower jaw.

76. M. *vulgaris*. Common Cod.—The first ray of the anal fin spinous.

Asellus merluccius, *Merr.* Pin. 184.—A major, *Sibb.* Scot. 23. *Will.* Ich. 165.—Gadus Morhua, *Linn.* Syst. i. 436. *Penn.* Brit. Zool. iii. 172.—*E*, Keeling.—Abundant on many parts of the coast.

Length about 3 feet. Colour grey above, freckled with yellow; beneath white. The lateral line straight to opposite the vent, when it bends towards the tail, white and broad. The tail is nearly even. The jaws equal. 1st D. 12, 2d 18, 3d 16; P. 14; V. 7; 1st A. 20, 2d 16; C. 36. Spawns in spring.—This fish, universally esteemed as an article of food, is eagerly sought after on those sea-banks which it frequents. The most extensive fisheries in our seas are off the western isles and the coast of Zetland.

The *Morhua callarias* or Torsk, first inserted in the British Fauna by Berkenhout, syn. i. 67, probably on the authority of a passage in Willoughby, (non ita dudum piscator hujus generis Asellum 4 pedes longum in sinu minore ad Ekrefordiam urbem cepit, raro spectaculo.—*Ich.* p. 172.) does not appear to have been noticed in our seas or estuaries by any recent observer. It differs chiefly from the common cod in the lateral line being spotted, and the upper jaw being longer. The tail is even, or a little rounded.

77. M. *Æglefinus*. Haddock.—Upper-jaw longest; tail forked. A spot behind the pectorals, and the lateral line black.

A. Haddock, *Merr.* Pin. 184.—Asellus Callarias, *Sibb.* Scot. 23.—Onos, *Will.* Ich. 170. Gadus æg. *Linn.* Syst. i. 435. *Penn.* Brit. Zool. iii. 179. Common on many parts of the coast.

Length 18 inches. Back dusky; belly white; head sloping; eyes large. Fins like the preceding. Spawns in spring. Gregarious like the cod, but shifting its haunts at uncertain intervals. Superstition assigns the black lateral marks to the impression of St Peter's thumb and finger, when he took the tribute out of the mouth of a fish, supposed to be of this species, and which mark has been continued to the race.

78. M. *lusca*. Bib.—The first ray of the ventral fins produced and setaceous.

Asellus luscus, *Will.* Ich. 169. Gadus luscus, *Linn.* Syst. i. 437. *Penn.* Brit. Zool. iii. 184. Not uncommon.

Length about a foot. Body broad; sides compressed; back olive; belly white. Scales large. Tail nearly even. One row of long recurved teeth. Eyes covered with a loose membrane. The 1st d. 12, (the second ray longest) 2d 23, 3d 2; p. 16; v. 7. This species is the *Beb* or *Blinds* of Cornwall, the Miller's Thumb, or Deillion, in Caernarvon, and the Smeltie of Zetland.

79. M. *barbata*. Pout.—Back arched; the first dorsal fin triangular, ending in a long fibre.

Asellus sub mento barbatus, *Merr.* Pin. 184. A. mollis latus, *Lister*, Will. Ich. app. 22. Gadus barbatus, *Linn.* Syst. i. 437. *Penn.* Brit. Zool. iii. 183. *E*, Whiting Pout, Kleg. A rare species.

Length about a foot. Colour whitish; a spot behind the pectorals; the fins and tail black. Body remarkably deep; back carinated; scales small; tail even. Lateral line white, broad and crooked. Mouth small; on each side of the lower jaw are seven or eight punctures.

80. M. *minuta*. Poor.—Nine punctures on each side of the jaws and gill-covers. Peritoneum black.

Asellus mollis minor, *Will.* Ich. 171. *Jago*, Ray Syn. Pisc. 163. Gadus minutus, *Linn.* Syst. i. 438. *Penn.* Brit. Zool. iii. 185. *Block*, Ich. t. 67. Found on the coast of Cornwall by the Reverend Mr Jago.

Length about 6 inches. Back light brown; belly whitish. Body lengthened. Tail rounded. Lateral line narrow, straight. Anus in the middle of the body. 1st D. 12, 2d 19, 3d 17; P. 13; V. 6; 1st A. 27, 2d 17. Approaches the shore in spring.

81. M. *punctatus.*—" Pale brown, with golden spots; beneath white, thickly covered with minute dusky specks; upper jaw longer."

" Speckled Cod, (Gadus punctatus, *Turton's* Brit. Fauna, i. 90.) Taken frequently in the Weirs at Swansea."

" Body 18 inches long, slightly arched on the back, a little prominent on the belly; covered, above, with numerous gold-yellow roundish spots; beneath, with dusky specks, which are stellate under a glass. Head large, gradually sloping; teeth small, in several rows in the upper jaw, in the lower a single row; nostrils double; iris reddish, pupil black; chin with a single beard; nape with a deep longitudinal groove. Lateral line nearer the back, curved as far as the middle second dorsal fin, growing broader and whiter towards the end. Upper fins and tail brown, with obscure yellowish spots, and darker towards the ends; lower ones tinged with green. Vent near the middle of the body. Scales small, all of them, under a glass, minutely spreckled with brown; gill-covers of two pieces. Lower-jaw with 5 obscure punctures on each side. Dorsal fins 14-20, 18 rayed; pectoral 18; ventral 6, the first ray shorter than the second, and divided a little way down; anal 19-16; tail even, 36, rayed. Differs from *Gadus Morhua* (M. *vulgaris*) in not having the first anal ray spinous, and in the lower jaw being considerably longer; from G. *luscus* in the first ray of the ventral fin being shorter than the second; from G. *barbatus* in wanting the 7 distinct punctures on the lower jaw, in its small scales, and in the first dorsal fin not ending in a long fibre; and from G. *Callarias*, in not being spotted with brown, and in having the lateral line white."

GEN. XXXIX. MOLVA. LING.—Body lengthened; head flat; lateral line straight. The second dorsal and anal fins long, the rays of nearly equal length.

82. M. *vulgaris.* Common Ling.—Upper-jaw longest; tail rounded; with a dusky bar.

Asellus varius Molva, *Merr.* Pin. 184. *Sibb.* Scot. 23.—A. longus, *Will.* Ich. 175.—Gadus Molva, *Linn.* Syst. i. 439. *Penn.* Brit. Zool. iii. 197.—Common.

Length from 3 to 4 feet. Above, grey, inclining to olive; beneath white; the dorsal and anal fins edged with white. 1st D. 15, 2d 65; P. 15; V. 6; A. 62. Spawns in spring. When in season as food the liver is white.

83. M. *Lota.* Burbot.—Jaws equal; tail oval, slightly pointed.

Mustela, *Merr.* Pin. 190. *Will.* Ich. 125.—Gadus Lota, *Linn.* Syst. i. 440. *Penn.* Brit. Zool. iii. 199. *Don.* Brit. Fishes, t. 92.—*E*, Eelpont, Coneyfish, Birdbolt.—In slow running rivers, England.

Length from 1 to 3 feet. Colour brownish, blotched with olive or yellow. Teeth small. The first dorsal fin is short, with 11 rays; the second extends almost to the tail, of 61 rays; P. 16; V. 7; A. 50. Spawns in December. Esteemed a delicate fish for the table.

GEN. XL. PHYSCIS. FORK-BEARD. Ventrals consisting of one produced divided ray.

84. *P. furcatus.* Common Fork-beard.—Anterior dorsal fin triangular, the first ray slender and produced.

Asellus Callarias, *Will.* Ich. 205.—Barbus major, *Jago*, Ray, Syn. Pisc. 163.—Forked Hake, *Penn.* Brit. Zool. iii. 193.—Blennius Gadoides, *Risso*, Ich. 136.—On the south coast of England.

Length about a foot. Eyes large; irides white; lateral line incurvated. The ventrals twice as long as the head. 1st D. 10, 2d D. 62, P. 12, A. 56. Tail rounded. Mr Couch states that a few spines are placed before the anal fin, Linn. Trans. xiv. 75.—This species was first detected by the Rev. G. Jago, on the coast of Cornwall, where it was known by the name of the Great Forked Beard.

GEN. XLI. GADUS. GADE.—Rays of the first dorsal fin short, partly detached. Head of the ordinary size.

85. *G. Mustela.* Five-bearded Gade.—Four beards on the upper, and one on the lower jaw. First ray of the dorsal fin produced.

Mustela vulgaris, *Will.* Ich. 121.—Gadus Mustela, *Linn.* Syst. i. 440.—Five-bearded Cod, *Penn.* Brit. Zool. iii. 202. *Don.* Brit. Fishes, t. xiv.—*E*, Sea Loche, Whistle-fish, Rockling.—On the English and Scottish coasts.

Length 18 inches. Colour olive above; belly whitish. Two of the beards are on the end of the snout, and two immediately above these. 2d D. 49, P. 14, V. 6, A. 40, C. 24, rounded.

86. *G. tricirratus.* Three-bearded Gade.—Two beards on the upper, and one on the lower jaw. All the rays of the first dorsal fin short.

M. vulg. var. *Will.* Ich. 121.—Three-bearded cod, *Penn.* Brit. Zool. iii. 201. *Don.* Brit. Fishes, t. 11.—Common among rocks near the shore.

Length about 18 inches. Colour reddish-yellow, with large black spots. These, however, according to Montagu, are not observed till the fish exceeds 6 or 7 inches in length, previous to which the colour is rufous-brown. The lateral line bends in the middle, and then passes straight to the tail. 2d D. 54, P. 20, A. 46, C. (rounded) 24.—By some naturalists this is considered as a variety only of the preceding species.

87. *G. argenteolus.* Silvery Gade.—Two beards on the upper, and one on the lower jaw. The first ray of the dorsal fin produced.

Mont. Wern. Mem. ii. 449.—Thrown ashore on the south coast of Devon in the summer of 1808.

Length about 2 inches. Back bluish-green; belly silvery. Head obtuse; the upper jaw longest. Rays of the first dorsal fin numerous, short. Pectorals rounded, of 16 rays. Ventrals 6 rayed, the middle ray produced. Tail nearly even at the end.—This species, in the condition in which it occurred to Montagu, in numbers, had not probably attained its full size.

GEN. XLII. RANICEPS.—The first dorsal fin obscure. Head depressed and very broad. Mouth wide, with regular incurvated teeth. Rays of the ventrals produced.

88. *R. trifurcatus.* Lateral line tuberculated above the pectoral fins.

Trifurcated Hake, *Davies*, *Penn.* Brit. Zool. iii. 196, and edition 1812, iii. 272.—South coast of England.

Length about 12 inches. Colour deep brown, the lips white. Eyes large, irides yellow. Body compressed, especially towards the tail. The first dorsal fin consists of three slender minute rays placed in a furrow. 2d D. 62, P. 23, V. 6. (the three last short), A. 59, C. 36. Tubercles 9 or 10 on each side, from the last of which the lateral line commences, is curved in the middle, and then straight to the tail; caudal and pectoral fins rounded. Mr Donovon, in the preface to his work on British Fishes, declares that Pennant was misled when he instituted the trifurcated hake as a distinct species, as the description was taken from a damaged skin of the forked hake; and he adduces the authority of the Rev. Hugh Davies in support of his opinion. In the last edition of the British Zoology, the trifurcated hake is continued as a distinct species, and several additional facts illustrative of its history given, likewise on the authority of the Rev. Hugh Davies! We cannot unravel such mysterious contradictions.

89. *R. Jago.* Lateral line smooth.

Barbus minus, *Jago*, Ray, Syn. Pisc. 164. *Penn.* Brit. Zool. iii. 195.—Couch, *Linn.* Trans. xiv. 75.—Coast of Cornwall.

This species was first noticed by the Rev. Mr Jago, whose name we have adopted as its trivial appellation. It has since been observed by Mr Couch, who has given the following description of its peculiarities:—"Length 10 inches. Head wide and flat. Eyes forward and prominent. Under jaw shortest. Teeth in the jaws and palate, sharp and incurved, and some in the throat. Small barb at the under jaw. Body compressed, smooth. First dorsal fin triangular, and extremely small; second dorsal fin and the anal fin long, ending in a point; tail round; ventral fins have several rays, of which the two outmost are much elongated, the longest measuring two inches; the fins all covered with the common skin. A furrow passes above the eyes to the back. Stomach firm, with longitudinal folds; no appendix to the intestines. Air-bladder large, and of unusual form. In the intestines were the remains of an echinus."

GEN. XLIII. BROSMUS. TUSK.—The small dorsal and anal fins lengthened; ventrals fleshy, with five rays.

90. *B. vulgaris.* Common Tusk.—Fins edged with white; tail and pectorals rounded.

Brismack, Lump, Tusk, *Sibb.* Desc. Orkney and Zetland, p. 8.—Torsk, *Penn.* Brit. Zool. iii. 203. *Low*, Ork. 200.—Gadus Brosme, *Don.* Brit. Fishes, t. 70.—On the sea-banks, especially off the coast of Zetland.

Length about 2 feet. Above dusky; sides yellowish; belly white. Lateral line a little incurvated. Body compressed behind the vent. A furrow on the neck. D. 49, P. 21, V. 5, A. 37, C. 35.—This fish is caught along with ling and cod. When salted it is deservedly esteemed. Pennant originally confounded this species with the torsk or dorse, Morhua callarias.

GEN. XLIV. MERLANGUS. Three dorsal and two anal fins.

91. *M. vulgaris.* Whiting.—Upper jaw longest; a black spot at the base of the pectorals; lateral line nearly straight, white.

Asellus mollis, *Merr.* Pin. 184. *Sibb.* Scot. 23. *Will.* Ich. 170.—Gadus Merlangus, *Linn.* Syst. i. 438. *Penn.* Brit. iii. 190.—Common.

Length about a foot. Above pale brown; belly and sides silvery; the latter streaked with yellow. Teeth of the upper jaw long. 1st D. 15, 2d D. 18, 3d D. 20, P. 19, V. 6, 1st A. 34, 2d A. 20. The whiting is caught chiefly in the spring and summer months, and esteemed the most delicate food of any of the family to which it belongs.

92. *M. Pollachius.* Pollack.—Lower jaw longest. Lateral line incurvated, black.

Asellus mollis nigricans, *Merr.* Pin. 184.—A. Huitingo Pollachius, *Will.* Ich. 167.—Gadus Pol. *Linn.* Syst. i. 439. *Penn.* Brit. Zool. iii. 188.—*E*, Whiting Pollach, Leets; *S*, Lythe.—Common on the rocky coasts.

Length about 18 inches. Above dusky-green; sides with yellowish streaks; belly white. Body sloping from the first dorsal fin. 1st D. 12, 2d D. 19, 3d D. 16, P. 18, V. 6, 1st V. 28, 2d A. 17. Tail nearly even at the end. Eyes large; irides of a bronze colour. Peritoneum silvery, with a few black spots. —This fish is frolicksome, and easily caught with a white fly.

93. *M. Carbonarius.* Coal-fish.—Lower jaw longest. Lateral line straight, white.

Asellus niger, *Merr.* Pin. 184. *Sibb.* Scot. 23. *Will.* Ich. 168.—Gadus car. *Linn.* Syst. i. 438.—*E*, Scarborough Parr, Billets; Rawlin Pollack.—*S*, Podley, Sillock, Cuddy, Glassock, Cooth, Piltock, Colmey, Sethe, Sey, Grey Lord.—Common on rocky coasts and in tideways.

Length from 2 to 3 feet. Above, including the tail, black; belly, ventral, and anal fins, white. Head small. 1st D. 14, 2d D. 20, 3d D. 22, P. 18, V. 6, 1st A. 22, 2d A. 19. The tail is broad and forked.—The young of this fish swarm on many parts of the coast, and contribute, in a very great degree, to the sustenance of the population of the Northern and Western Islands. The full grown fish are likewise taken abundantly, especially in tideways, but are reckoned greatly inferior to the cod and ling.

94. *M. virens.*—Jaws equal; lateral line straight.

Gadus v. *Linn.* Syst. i. 438. *Penn.* Brit. Zool. app. vol. i.—Not uncommon.

This species, which was inserted in the British Fauna by Pennant, on the authority of Sir John Cullum, Bart. is less than a foot. The back and fins green; the belly silvery; the fins with numerous black dots. Teeth in the upper jaw numerous, strong. 1st D. 15, 2d D. 24, 3d D. 19, P. 22, V. 6, 1st A. 27, 2d A. 22.—It is frequently taken in the Frith of Forth, during summer.

GEN. XLV. MERLUCIUS. HAKE.—Two dorsal and one anal fin.

95. *M. vulgaris.* Common Hake.—The first dorsal fin triangular; tail even.

Asellus fuscus, *Merr.* Pin. 185.—A. primus, *Will.* Ich. 174.—Gadus Mer. *Linn.* Syst. i. 439. *Penn.* Brit. Zool. iii. 191.—On the southern coast of England and Ireland; rare in Scotland.

Length about 2 feet. Body lengthened; grey above, white beneath. Head flat, broad; the mouth wide; the lower jaw longest; 1st D. 9, 2d D. 40, P. 12, V. 7, A. 39. The second dorsal and anal fins are long, and the rays nearly of equal length. This fish is caught in vast quantities in the summer months, and used fresh or salted for exportation.

GEN. XLVI. PLEURONECTES. TURBOT.—Mouth entire; teeth numerous, slender. Lateral line curved. Eyes on the left side.

96. *P. maximus.* Common Turbot.—The upper and under surfaces beset with acute tubercles; scales small.

Rhombus, *Merr.* Pin. 189.—R. maximus asper, *Will.* Ich. 94.—R. aculeatus, *Sibb.* Fife, 119.—Pleur. max. *Linn.* Syst. i. 459. *Penn.* Brit. Zool. 233.—*S*, Gunner-fleuk, Raun-fleuk, Bannock-fleuk.—Common.

Length upwards of 2 feet. Weight sometimes exceeding 20 pounds. Outline of the body sub-circular. Colour above, yellowish, clouded with brown; below white. The tubercles are largest on the upper surface. D. 60, P. 12, V. 6, A. 43, C. 17. The flesh of this species is held in great estimation, and extensive fisheries, by hook and line, are conducted on different parts of the coast. The bait consists of portions of herring, haddock, muscles, or limpets, as fresh as possible.

97. *P. Rhombus.* Brill.—Body broad, glabrous; lower jaw longest.

Rhombus lævis, *Jago*, Ray Syn. Pisc. 162.—Bonnet flook, *Sibb.* Fife, 120.—P. Rh. *Linn.* Syst. i. 458.—Pearl, *Penn.* Brit. Zool. iii. 238.—Bril, *Don.* Brit. Fishes, t. 951.—*E*, Bril, Pearl, Kite; *S*, Bannet-fleuk.—Common.

Less than the turbot. Colour above fuscous, spotted with brown, yellow and white. The soft smooth skin is the peculiar character of the species. D. 65, P. 11, V. 6, A. 48, C. 16.—This species occasionally enters the estuaries of the larger rivers. The Rhombus non aculeatus squamosus of *Will.* Ich. (the Lugaleaf of Cornwall), is probably the same as the Brill, though the eyes are stated to be placed on the left side of the mouth.

98. *P. Megastoma.* Whiff.—Body oblong. Mouth large; lower jaw longest. Lateral line tuberculated, greatly arched near its origin. Dorsal and anal fins broadest in the middle.

Rhombus aculeatus, *Will.* Ich. 93.—Passer Cornubiensis asper, magno oris hiatu, *Jago*, Ray Syn. Pisc. 163.—Whiff, *Penn.* Brit. Zool. iii. 238.—P. meg. *Don.* Brit. Fishes, t. 51.—South coast of England.

Length about 18 inches. Colour above brown, clouded with darker shades; below reddish-white. Eyes large, elevated; irides yellow. Tail slightly rounded. D. 85, P. 13, V. 5, A. 61, C. 19.—This species has been confounded, by several authors, with the following, from which, however, in many particulars, it is sufficiently distinguished.

99. *P. punctatus.* Top-knot.—Body roundish, rough, with small denticulated scales. Dorsal and anal fins broadest near the retral extremity. Jaws nearly equal.

Bloch, Ich. t. 189.—*Hanmer*, Penn. Brit. Zool. edition 1812, iii. 322. *Flem.* Wern. Mem. ii. 241; Phil. Zool. t. iii. f. 2.—Little known on the coast.

Length 5 inches and upwards. Colour above black, mottled with brown, and spotted with red; beneath white. Denticles of the scales from 4 to 8 in number. D. 79. (the first longer than those which immediately follow), P. 9, V. 6, A. 68, C. 17.—This species seems first to have been observed as a British fish, by E. Hanmer, Esq. on the coast of Devon and Cornwall, in 1806–7. A single specimen occurred to myself, 18th January 1810, in Zetland, where, according to the testimony of the fishermen, it is not uncommon.

100. *P. Arnglossus.* Scald-fish.—Body oblong. Scales deciduous. Jaws equal.

Arnglossus vel Solea lævis.—A. Lantern, *Will.* Ich. 102. *Hanmer*, Penn. Brit. Zool. edition 1812, iii. p. 325. t. 53.—South coast of England.

According to Mr Hanmer, " The colour of the upper side is a pale brown or dirty white. The body has something of the same pellucid appearance as the lantern, though in a less degree. Head rather small; the jaws of equal length, blunt; the lateral line bent near the head. The dorsal fin consists of 82 rays, as does the anal, which reaches to the tail; the pectorals of 10 rays; a double row of rays, five in each, form the ventral fins; behind them is one or more short and sharp spines; the tail is rounded at the extremity; the rays of all the fins, including those of the tail, are bristly, and connected by a thin film or pellicle, which is easily broken. The scales are so deciduous that the friction of the trawl alone is sufficient to remove them; when taken out of the net they are usually dead, and in that bare state which gives some propriety to the name they are known by of Scald-fish. They seem only to be known at Plymouth, and occur there very rarely. Their length is rather more than 5 inches; their breadth not exceeding 2 inches; and are probably the smallest of the English species, and of corresponding value." Had not the shape of the mouth in Mr Hanmer's figure, and the position of the eyes on the left side been in opposition, I would have placed this species in the genus Solea.

GEN. XLVII. SOLEA. SOLE.—Mouth twisted; the jaws destitute of teeth on the eye side.

101. *S. vulgaris.* Common Sole.—Upper jaw longest. Scales rough. Tip of the upper pectoral fin black.

Solea, *Merr.* Pin. 187.—Buglossus seu S. Rondeletii. *Sibb.* Fife 120.—Pleuronectes Solea, *Linn.* Syst. Nat. i. 457. *Penn.* Brit. Zool. iii. 231.—Common, especially on the more southern coasts.

Length from 1 to 2 feet, and from 1 to 7 pounds weight. Above brown, beneath white. Irides yellow. Lateral line arched on the head; from thence to the tail, straight. Margin of the scales fringed with spines about 10 in number. D. 97, P. 10, V. 8, A. 83, C. 17. Flesh firm, white, and delicious; in high repute in the market.—This fish is gregarious, and is usually taken by the trawl-net.

102. *S. variegata.*—" Body oblong; pale, clouded or marbled with fuscous. Scales large."

Pleuronectes var. *Don.* Brit. Fishes. t. cxvii.—P. Lingula, *Hanmer*, *Penn* Brit. Zool. edition 1812, iii. p. 313.—English coast, rare.

This species nearly resembles the preceding in general character, but differs in shape, being more rounded and short; in the scales being shorter, broader, and fringed with more numerous spines, and in the dorsal and anal fins not reaching so closely to the tail. D. 68, A. 53, C. 16. According to Mr Hanmer, its flesh is inferior to the sole; and he adds, it is common in the spring, upon the coast, near Plymouth.

GEN. XLVIII. PLATESSA.

FLUKE.—A row of obtuse cutting teeth in each jaw. A spine at the beginning of the anal fin. Tail rounded.

103. *P. vulgaris.* Plaise.—Body smooth. A row of six tubercles on the head.

Passer aureus, *Merr.* Pin. 187. *Sibb.* Scot. 24.—Passer Bellonii, *Will.* Ich. 96.—Pleuronectes Platessa, *Linn.* Syst. i. 456. *Penn.* Brit. Zool. iii. 228.—*S*, Fluke, Dutch Plaise.—Common.

Length about a foot. Above olivaceous, with reddish spots; beneath, white. Scales small, impressed, and adherent. Mouth small; lower jaw longest. D. 72, P. 11, V. 6, A. 54.—Spawns in February.

104. *P. Flesus.* Flounder.—Body smooth. A band of small sharp spines on the side line, and at the junction of the dorsal and anal fins with the body.

Passer niger, *Merr.* Pin. 187.—Lævis, *Sibb.* Scot. 24.—P. fluviatilis, *Will.* Ich. 98.—Pleuronectes linea laterali aspera, spinulis ad radices pinnarum in latere oculato. *Artedi*, Ich. Desc. 59.—Pl. Flesus, *Linn.* Syst. i. 457. *Penn.* Brit. Zool. iii. 229.—*S*, Mayock-fleuk.—Common.

Length about a foot. Colour olivaceous, occasionally marbled with brown, sometimes whitish, yellowish, or rosy. Scales very small, adherent. Lateral line elevated and denticulated on the head; and bent over the gills. Mouth small. D. 60, P. 12, V. 6, A. 42, C. 18.—This species is more frequently to be met with at the mouths of rivers than any of the genus. A sinistral variety sometimes occurs.

105. *P. Limanda.* Dab.—Scales, with ciliated margins.

Passer asper, *Will.* Ich. 97.—Pleuronectes squamis asperis; spina ad anum, *Art.* Ich. Desc. 58.—Pleur. Limanda, *Linn.* Syst. i. 457. *Penn.* Brit. Zool. iii. 230.—*S*, Saltie.—Common.

Length seldom reaching to a foot. Colour above brownish, frequently with darker clouds. Scales large. Mouth wide. D. 73, P. 11, V. 6, A. 63, C. 15.—In season for the table in spring. Spawns in May.

106. *P. microcephalus.*—Body oblong. Head small. Mouth diminutive. Lateral line a little incurvated.

Smear Dab, *Penn.* Brit. Zool. iii. 230.—Pleuronectes microcephalus, *Don.* Brit. Fishes, t. lxii.—Sand-fleuk, *Neill*, Wern. Mem. i. 537.

Length about a foot. Colour above, dusky-brown; beneath, white. Lips protruded. Scales small, smooth. Lateral line a little incurvated over the pectoral fin. D. 90, P. 7, V. 6, A. 73, C. 17. The Smear-Dab of Pennant appears, from the description, to be similar to the P. microcephalus of Donovan; but the figure of the former author, differs, in all its characters, from the one given by the latter. It may be stated, that, in the last edition of the British Zoology, the original figure of the Smear-Dab is suppressed; while a new representation of a fish under the same title is given, which bears little resemblance to the former, while it makes a near approximation, in the shape of the head, to Donovan's figure. In shape, the original figure of the Smear-Dab in the Brit. Zool. t. lxi. resembles the Pleuronectes punctatus.

107. *P. Cyclops.*—Eyes on the left side; the left eye subvertical.

Pleuronectes Cyclops, *Don.* Brit. Fishes, t. xc.—At Aberfraw in Anglesea, Captain Merrick.

Length 1$\frac{3}{8}$th inches. Body broad, with dusky spots, surrounded by a whitish ring, smooth. Middle rays of the dorsal and ventral fins longest. Head protruded; the left eye placed in the middle of the lateral edge. Lateral line curved over the pectorals.—This is probably the fry of some of the preceding species, belonging to a reversed variety.

GEN. XLIX. HIPPOGLOSSUS. HOLIBUT.—Teeth numerous, slender, pointed. A spine in front of the anal fin. Tail lunated.

108. *H. vulgaris.* Common Holibut.—Body lengthened, smooth. Lateral line bent over the pectorals.

Passer Britannicus, *Merr.* Pin. 187.—Rhombus lævis, *Sibb.* Scot. 24.—Hippoglossus, *Will.* Ich. 99.—Pleuronectes Hipp. *Linn.* Syst. i. 456. *Penn.* Brit. Zool. iii. 226.—Common.

Upwards of 2 feet in length, and in weight sometimes exceeding 200 pounds. Colour above dusky-brown, beneath white; free from spots. Body tapering towards the tail. D. 105, P. 15, V. 6, A. 79, C. 17.—The flesh of this species is not held in high estimation. It is generally called Turbot in the Edinburgh market.

GEN. L. ANGUILLA. EEL.—Gill-opening under the pectorals. Anal, dorsal, and caudal fins continuous.

109. *A. vulgaris.* Common Eel.—Colour of the dorsal and anal fins uniform.

A. *Merr.* Pin. 189. *Sibb.* Scot. 25. *Will.* Ich. 109.—Muræna unicolor, maxilla inferiore longiore, *Art.* Ich. Syn. 39.—Muræna Anguilla, *Linn.* Syst. i. 426. *Penn.* Brit. Zool. iii. 142.—Common in rivers and estuaries.

Length from 1 to 3 feet. Colour, above, dark olive-brown, whitish on the belly. In the variety called *silver eel*, the belly and sides are silvery and subtranslucent. The head is depressed; the lower jaw longest. Eye immediately above the gape; irides reddish. Nostrils with two openings on each side; one a simple pore near the eye, the other a tubular wart on the snout. Gill-opening immediately in front of the temporal fin. This species spawns in the sea; for which purpose it leaves the lakes and rivers, descending from August to November. It migrates in greatest numbers in dark stormy nights. The young ones begin to appear on the shore in March, April, or May, and proceed in myriads towards the mouths of rivers for the purpose of ascending to the lakes and marshes. In their ascent, where eel fisheries are of value, the young are assisted in surmounting obstacles, such as the barrier of a mill-dam or a cascade, by straw-ropes, so placed that the young eels can twist themselves round, and reach the summit. The migrations of the eel were first pointed out with accuracy by *Redi* (Opus. part iii. p. 99, ed. 1729). Some good observations by the Rev. George Mack, are recorded in the Statistical Account of Scotland, vol. xvi. p. 388, in reference to the eels of the Dee.

Mr Pennant notices a " variety of this fish known in the Thames by the name of *grigs*, and about Oxford by that of grigs or *gluts*. These are scarcely ever seen near Oxford in the winter, but appear in the spring, and bite readily at the hook, which common eels in that neighbourhood will not. They have a larger head, a blunter nose, thicker skin, and less fat than the common sort; neither are they so much esteemed, nor do they often exceed 3 or 4 pounds in weight."—Brit. Zool. iii. 145.

110. A. *Conger*. Conger-Eel.—Margin of the dorsal and anal fins black.

Conger, *Merr.* Pin. 185. *Sibb.* Scot. 23. *Will.* Ich. 111.—Muræna supremo margine pinnæ dorsalis nigro, *Art.* Ich. Syn. 40.—Muræna Conger, *Linn.* Syst. i. 426. *Penn.* Brit. Zool. iii. 147.—In the sea, common.

Length about 5 feet; sometimes reaching to 10, and weighing 130 pounds, Above dark olive, beneath whitish; the lateral line broad and white. Irides silvery. Upper jaw longest. The dorsal fin commences nearer the head in this species than in the common eel. This species resides always in the sea, is exceedingly voracious, and tenacious of life. It is chiefly found on a rocky bottom. The small eels which come up the Severn in April, noticed by Willoughby and Pennant, are probably not the young of the conger, but of the common eel.

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The two following species have long occupied a place in the British Fauna, and though their claims appear doubtful, they deserve some notice.

a. *A. Myrus.* Flat-tailed Sea Serpent.—This resembles the conger, but is smaller, the back spotted with white, an occipital white band, and the fins bordered with black. This species was inserted as British by Berkenhout (Syn. i. 64.), without reference to any habitat.

b. *Ophisurus Ophis.* Spotted Sea Serpent.—This species is distinguished from those of the genus Anguilla by the naked pointed tail, It was first inserted by Merret (Pinax, 185.), afterwards by Sibbald (Scot. 23.), and latterly by Berkenhout (Syn. i. 64.), as a British fish; but by none of these authors were any remarks, illustrative of the time or place of capture, communicated.

GEN. LI. LEPTOCEPHALUS. MORRIS.—Body compressed like a ribband. Dorsal, anal, and caudal fins united.

111. L. *Morisii.*—Dorsal and ventral margins with minute black spots.

Penn. Brit. Zool. iii. 158. *Mont.* Wern. Mem. ii. 436, tab. xxii. 1.—On the southern shore of England.

Length 6 inches, breadth half an inch, and about the sixteenth part of an inch in thickness. Body semipellucid. Head small, but nearly in a straight line with the back. Lateral line straight. Jaws equal; teeth numerous, inclining forwards. Eyes large, irides silvery. Branchial aperture small, transverse. Dorsal fin commences at nearly one-third of the length of the fish from the head. Vent a little nearer the head than the tail. Pectorals small.—This singular species was first observed near Holyhead by Mr William Morris, who communicated the specimen to Pennant. Though seemingly a rare species, it has since been found by Mr Lewis Morris, the Rev. H. Davis, and Mr Anstice.

GEN. LII. OPHIDIUM.——Anal, dorsal, and caudal fins united; tail pointed.

112. O. *imberbe.*—Lower jaw beardless.

Linn. Syst. i. 431. *Penn.* Brit. Zool. iii. 398. *Mont.* Wern. Mem. i. 95. t. iv. f. 2.—Coast of Devon.

Length 3 inches. Purplish brown; bluish spots along the base of the anal fin. Head obtuse, body compressed towards the tail. Mouth ascending; lips marginated. Eyes large; irides dark, with a silvery circle round the pupil. Vent near the middle. D. 77, P. 11, A. 44, C. 18. Pectorals rounded; the dorsal fin commencing immediately above them.—This species, as a British production, was first communicated to Pennant from Weymouth by the Duchess Dowager of Portland. Montagu has since found it on the south coast of Devon.

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The *O. barbatum*, a species readily distinguished from the preceding by the lower jaw having two bifid cirri, has been noticed by Berkenhout in his Synopsis, p. 66. as a British production, without any intimation respecting the circumstances of its capture. He, however, takes no notice of the *O. imberbe*, which had previously appeared in the British Zoology.

GEN. LIII. AMMODYTES. LAUNCE.—Dorsal, anal, and caudal fins disjoined. Neither cœca nor air-bag. Tail forked.

113. A. *Tobianus.* Common Launce.—Lower jaw longest; lips protrusile forwards and downwards.

Sandils, *Merr.* Pin. 187.—Ammodites, *Sibb.* Scot. 24. *Will.* Ich. 113.—Amm. Tob. i. 430. *Penn.* Brit. Zool. iii. 156.—Common on sandy shores.

Length 3 to 5 inches. Above bluish-green, with a darker band on each side; sides and belly silvery. Head small, pointed. Irides silvery. Lateral line straight. D. 54, P. 15, A. 28, C. 16.—This species is the favourite food of salmon and many other kinds of fish.—M. Lesauvage, in the Bulletin des Sciences, Sept. 1824, has instituted another species of this genus which he terms *A. lanceolatus*, and which has probably in this country been confounded with the preceding. He assigns to it the following character: "B. 7, D. 58, P. 13, A. 30, C. 16. Lon. 9 pouces, machoire extensible se redressant verticalement, en entrainant dans sa direction l'extremité mobile de la machoire non extensible."

ACANTHOPTERYGIOUS FISHES.

SECT. I. *Body lengthened, compressed, ribband-shaped, with an extended dorsal fin.*
- *a.* Snout short; maxillaries distinct.
  - Cepola.
- *aa.* Snout produced; gape wide; teeth strong.
  - Trichiurus.
  - Lepidopus.

II. *Rays of the dorsal fins slender and flexible. Intestines large, equal, without cæca.*
- *a.* With ventrals.
  - *b.* Ventral fins united.
    - Gobius.
  - *bb.* Ventral fins disjoined.
    - *c.* Gill-opening large, the membrane continued across the breast; ventrals reduced. One dorsal fin.
      - BLENNIUSIDÆ.
      - *d.* Head obtuse, the front nearly vertical. Teeth in one row, equal, close set, with large remote ones in the back part of the jaw.
        - Blennius.
        - Pholis.
      - *dd.* Head not sloping suddenly.
        - Gunnellus.
    - *cc.* Gill-opening small. Ventrals larger than the pectorals. Two dorsal fins.
      - Callionymus.
- *aa.* Destitute of ventral fins.
  - Anarhichas.

III. *Lips large and fleshy; one dorsal fin, with strong spinous rays, anteriorly terminating in filaments. Body oblong, scales large.*
- *a.* Cheeks and gill-covers scaly.
  - Crenilabrus.
  - Labrus.
- *aa.* Cheeks and gill-covers smooth.
  - Julis.

IV. *Dorsal and anal fins extensively covered with scales, rendering their junction with the body obscure.*
- Brama.

V. *Spinous portion of the dorsal fin capable of depression between the scales on each side at the base Scales distinct.*
- *a.* Dorsal fin single.
  - *b.* Gill lid without armature.
    - Sparus.
    - Pagrus.
    - Dentex.
  - *bb.* Gill lid armed with spines.
    - Serranus.
    - Cernua.

aa. Two dorsal fins.
  b. Head armed.
    c. Head armed with spines.
      d. Ventrals thoracic.
        Perca.
        Sciæna.
      dd. Ventrals jugular.
        Trachinus.
        Lophius.
    cc. Head armed with a coat of mail, by the extension of the suborbital bone: gill lid spinous.
      Trigla.
      Cataphractus.
      Cottus.
  bb. Head without armature.
    c. Ventral fins thoracic.
      Mullus.
    cc. Ventral fins abdominal.
      Mugil.
      Atherina.

SECT. VI. *Scales small, often scarcely perceptible, unless at the extremity of the lateral line, where they sometimes form a ridge. In other cases this ridge is formed by a protuberance of the skin, supported by transverse processes.*
  a. Two dorsal fins.
    b. The first dorsal fin entire.
      Scomber.
      Trachurus.
      Zeus.
    bb. Spines of the first dorsal fin without a connecting membrane. Ventrals consisting of a single spine each.
      Spinachia.
      Gasterosteus.
  aa. One dorsal fin, elevated at its origin and termination. No teeth.
    Lampris.
    Xiphias.

VII. *Mouth tubular.*
  Centriscus.

Gen. LIV. CEPOLA. BAND-FISH.—Dorsal, anal, and caudal fins continuous; upper jaw very short.

114. C. *rubescens*. Red Band-fish.—Colour carmine, with waved silvery bands on the sides.

Serpens rubescens, *Will.* Ich. 118.—C. rub. *Linn.* Syst. i. 445. *Mont.* Linn. Trans. vii. 291, t. xvii. *Couch.* ib. vol. xiv. 17.—South coast of England.

Length 10 to 15 inches. Body smooth, semipellucid, tapering from the head to the tail. Mouth large, sloping upwards; jaws with one row of distant, subulate, curved teeth; tongue short, smooth. Eyes large; irides silvery, mixed with crimson. Lateral line curved near the head in front of the pectorals. D. 17, P. 16, rounded, V. 6, oval, the first ray short, spiny, with a filament adjoining longer than the other rays, and detached from them; A. 61, C. 12, the middle ray longest. Two specimens of this fish occurred to Montagu on the south coast of Devon, and two from Cornwall have come into the possession of Mr Couch. According to Risso (Ich. 155.), it is frequently caught at Nice in May, July, and December.—The *C. Tænia* is distinguished from this species by the double row of teeth in the lower jaw, and the rough tongue, and the absence of the silvery bands.

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The *Gymnetrus Hawkenii* of Bloch (tab. 423.), and Shaw (General Zool. iv. p. 198.) here merits some notice. "It appears (says the latter) from a print published in the year 1798, that a specimen of this fish was thrown on the coast of Cornwall in the month of February in the same year. Its length was 8 feet 6 inches, its breadth in the widest part 10½ inches, and its thickness only 2¼ inches. The tail in this specimen was wanting. The colours the same as in the specimen figured by Bloch." In the specimens hitherto obtained, the caudal fin has been wanting, though in the published figures it has not been withheld. Indeed, the circumstance of the ventrals being filamentous with expanded extremities, would alone lead to the conclusion that it was the *Regalecus glesne* of Ascanius, a species found in the northern sea.

GEN. LV. TRICHIURUS. BLADE-FISH.—Tail pointed; no ventral, anal, or caudal fins. Scales indistinct.

115. T. *Lepturus*.—Colour silvery; lower jaw advanced.

Lepturus, *Artedi*, Ich. Desc. 111.—T. Lept. *Linn.* Syst. i. 429. *Bloch*, Ich. t. 158. *Hoy*, Linn. Trans. xi. 210.

Two specimens of this fish have been found dead and cast ashore in the Moray Frith, and examined by Mr James Hoy. The first on the 2d Nov. 1810, after a high wind from the north, was found at Port Gordon. "Its head was much broken, probably by being dashed upon the rocks about low-water mark; the bones of the upper part of the head still remained, and the sockets of the eyes were distinguishable very near to each other: the extremity of the upper jaw, or upper part of the mouth, was entire; upon either side of which was an operculum. The length of the head could not be measured exactly, but was about 8 or 9 inches. The body, from the gills to the point of the tail, was 3 feet 2 inches long; its greatest breadth 6¼ inches; and its greatest thickness only an inch. The vent was 2 inches from the gills: these were much broken, and partly gone, so that the number of rays could not be ascertained. Both sides of the fish were wholly white, without a spot upon them; the dorsal fin was the only part of a different colour, being a blackish-green: this fin ran all along the back from the gills to the tail, consisting of a great number of rays, soft, and little more than an inch long. Each of the pectorals had six double rays. There were no ventral nor anal fins, but the belly was a sharp, smooth, and entire edge. The tail ended in a point, consisting of three or four soft spines or bristles of different lengths, not exceeding 2 inches. The body was nearly of the same breadth for one-half of its length, and then its breadth diminished gradually till within three inches of the tail, when the diminution became more quick. The lateral line was straight, and strongly marked along the middle of the two sides."

Upon the 12th November 1821, another individual was found upon the beach, nearly at the same place. "Its head had been broken off, and was quite gone, a small bit of the gills only remained about the upper part of the throat; from whence, to the extremity of the tail, its length was 12 feet 9 inches; its breadth, 11¼ inches, was nearly equal for the first six feet in length from the gills, diminishing gradually from thence to the tail, which ended in a blunt point, without any of those kinds of bristles which projected from the tail of the one found formerly: its greatest thickness was 2½ inches. The distance from the gills to the anus 46 inches. The dorsal fin extended from the head to the tail, but was much torn and broken: the bones or muscles to which the pectoral fins had been attached were perceivable very near the gills. There were no ventral nor anal fins; but the thin edge of the belly was closely muricated with small hard points, which, although scarcely visible through the skin, were very plainly felt all along it. Both sides of the fish were white, with four longitudinal bars of a darker colour; the one immediately below the dorsal fin was about 2 inches broad; each of the other three about ¾ths of an inch. The side line straight along the middle."

From the preceding descriptions, which I have been induced to give in detail, it appears probable that the two fishes examined by Mr Hoy belonged to different species. The differences in the position of the vent, the structure of the tail, and the condition of the ridge of the belly, seem too great to justify the inference of their being only varieties. The latter fish appears identical with the *Lepturus* of Artedi, and consequently of Linnæus.

GEN. LVI. LEPIDOPUS. SCALE-FOOT.—Caudal and anal fins distinct. Two pointed scales in place of ventrals.

116. L. *tetradens.*—Anal fin developed, placed near the tail, which is lunate; pectorals pointed.

Vandellius Lusitanicus, *Shaw*, Gen. Zool. iv. part ii. 199.—Ziphotheca tetradens, *Mont.* Wern. Mem. i. 82, t. 2, 3. and vol. ii. p. 432.—On the coast of Devon.

Length upwards of 5 feet. Body silvery, without scales, and smooth, carinated dorsally and ventrally. Lateral line straight. Head depressed, porrected; the lower jaw longest, ending in a callous lip. Jaws with an irregular row of sharp-pointed teeth; four larger ones in the upper jaw. Irides and mouth silvery. D. 105, (the first three rays spinous); P. 12, (the lower rays longest). The ventral scales behind the pectorals. A. 17. Vent near the middle. The first British example of this fish was taken in Salcomb harbour, Devon, June 1808, and measured, according to Montagu, 5½ feet. Another, only 10 inches in length, occurred likewise on the Devon coast February 1810.—This species differs from the *L. Gouanianus* (*Gouan*, Hist. Pisc. 185, tab. i. f. 1.) in the lunated tail, and the developed anal fin; and seems likewise to differ in the position of the vent and number of rays in the dorsal fin, from *L. Peronii* of Risso (Ich. 148).

Gen. LVII. GOBIUS. Goby.—Ventral fins, thoracic, forming a concave disc by their union, but not capable of acting as a sucker. With an air-bag.

117. G. *niger.* Black Goby.—Tail rounded.

Gobius marinus, *Merr.* Pin. 189. *Sibb.* Scot. 24.—G. niger, *Will* Ich. 206. *Linn.* Syst. 1. 449. *Penn.* Brit. Zool. iii. 213.—Groundling, Rock-fish.—On the English and Scottish coasts.

Length 5 inches. Body brownish above, white beneath, variegated with dark streaks and spots. There is usually a black spot on each side behind the pectorals, and at the base of the tail. 1st D. 1, 2 D. 12 to 14, P. 18, V. 8, A. 12, C. 16.

118. G. *minutus.* Spotted Goby.—Tail even.

Penn. Brit. Zool. iii. 215. *Don.* Brit. Fishes, t. xxxviii. *Neill*, Wern. Mem. i. 534.—Taken in shrimp nets.

Length about 2½ inches. Body whitish, with ferruginous streaks; streaks of dots of the latter colour across the fins. 1st D. 6, 2 D. 11, P. 20, A. 11, C. 16. The head is flat, the eyes large and protuberant.

Gen. LVIII. BLENNIUS. Blenny.—Head furnished with fimbriated appendages.

* *Dorsal fin broad, abbreviated in the middle.*

1. *Head with two appendages.*

119. B. *ocellaris.* Ocellated Blenny.—First ray of the dorsal fin longest; crest fimbriated posteriorly.

B. Salviani, *Will.* Ich. 131.—B. ocellaris, *Linn.* Syst. i. 442. *Bloch*, Ich. t. 167. *Mont.* Wern. Mem. ii. 443, t. xxii. f. 2.—On the coast of Devon.

Length about 4 inches. Body brown, with a greenish tinge, spotted; a round purple spot with a white ring on the dorsal fin. Eyes nearly level with the crown; irides silvery. D. 25, P. 12, V. 3, A. 18, C. 12. Three individuals of this species were obtained by Montagu from an oyster-bed at Torcross, Devonshire, the only examples which have yet occurred on the British shores.

120. B. *Gattorugine.*—First ray of the dorsal fin short; crest fimbriated on both sides.

Gatt. *Will.* Ich. 132.—B. Gatt. *Linn.* Syst. i. 442. *Penn.* Brit. Zool. iii. 207. *Mont.* Wern. Mem. ii. 447.—Southern coast of England.

Length about 7 inches. Body rufous. Eyes above the level of the crown; irides orange. Lateral line arched above the pectorals. D. 33, P. 14, V. 2, A. 20, C. 12.—This species was first inserted in our Fauna by Pennant, a specimen having been found on the Anglesea coast. Montagu mentions another taken in a crab-pot on the south-east coast of Devon.

2. *Head with one appendage.*

121. B. *Montagui.*—The first rays of the dorsal fin on the neck detached.

B. Galerita var. *Mont.* Wern. Mem. i. 98. t. v. f. 2.—Devon.

Length about 2 inches. Body, above, olive-green, with blue spots; belly white. Eyes approximating. Crest transverse, fleshy, fimbriated, lateral line curved near the head. D. 30, P. 12, V. 2, A. 18, C. 14. In some individuals the dorsal fin had black spots, and the anal fin bordered with black.—This species has been taken in the pools among the rocks left by the tide on the south coast of Devon, by Montagu, who described it as a var. of the Crested Blenny, from which, however, it differs in many particulars.

*** Dorsal fin with a continuous margin.*

122. B. *Galerita.* Crested Blenny.—The two coronal appendages oblique, fimbriated at the extremity.

Linn. Syst. i. 441. *Penn.* Brit. Zool. iii. 206.—On rocky shores, rare.

Length about 5 inches. Body nearly of equal depth, brown, with minute spots. Eyes lateral. In front of the eye, above, a fimbriated appendage, with an intervening conical wart; behind the large coronal appendages, and on the neck, there are numerous pointed papillæ. D. 50, P. 14, V. 2, A. 39, C. 16. The anal and dorsal fins are continuous with the tail. The first three rays of the dorsal fin ends in short fleshy filaments.—This description applies to a specimen which I found in Loch Broom.

GEN. LIX. PHOLIS. SHAN.—Head destitute of appendages.

123. P. *lævis.* Smooth Shan.—Margin of the dorsal fin waved, and with the anal, disjoined from the tail.

Alauda non cristata, *Will.* Ich. 133.—Blennius Pholis, *Linn.* Syst. i. 443. *Penn.* Brit. Zool. iii. 208.—*Don.* Brit. Fishes, t. lxxix.—*E,* Mulgranoc, Bulcard.—Under stones, common.

Length 5 inches. Colour marbled black, olive and white. D. 32, P. 13, V. 2, A. 19, C. 12.—This species is commonly found lurking under stones and sea-weeds.

GEN. LX. GUNNELLUS. GUNNEL.—Dorsal, anal, and caudal fins, united.

124. G. *vulgaris.* Common Gunnel.—Body compressed; margin of the dorsal fin continuous.

G. Cornubiensium, *Will.* Ich. 115.—Blennius Gunnellus, *Linn.* Syst. i. 443. *Penn.* Brit. Zool. iii. 210. *Don.* Brit. Fishes, S. 27.—*E,* Butterfish; *N,* Swaar-fish, Swordick.—Common on the coast, lurking under stones.

Length 6 to 10 inches. Body yellowish-brown, the belly whitish, with a row of ten or twelve dark ocellated spots along the back, at the base of the dorsal fin. Gape ascending. D. 82, P. 12, V. 2, A. 43, C. 16.—Mr Low, in his *Fauna Orcadensis*, p. 203., mentions a variety of a reddish-purple colour. " It likewise wants the spots on the back, the other has; instead of eleven in the former, this has only a single one, and that placed near the beginning of the back fin."

125. G. *viviparus.* Viviparous Gunnel.—Body subcylindrical anteriorly; the margin of the dorsal fin suddenly waved near the tail.

Mustela vivipara, *Sibb.* Scot. 25. *Will.* Ich. 122.—Blennius viviparus, *Linn.* Syst. i. 43. *Penn.* Brit. Zool. iii. 211. *Don.* Brit. Fishes, t. xxxiv.—*S*, Eelpout, Guffer, Greenbone.—Common under stones.

Length 12 to 15 inches. Body, above, yellowish-brown, marbled with darker spots and streaks; beneath, yellow. Upper jaw longest. D. 92, P. 48, V. 2, A. 68, C. 48. This species has been long known as an ovoviviparous fish.—When boiled, the back-bone is green.

Gen. LXI. CALLIONYMUS. Dragonet.—Head depressed; eyes approximated above.

126. C. *Lyra.* Gemmeous Dragonet.—The first ray of the dorsal fin reaching to the tail.

Lyra, *Merr.* Pin. 186.—Dracunculus marina, *Bor.* Corn. 270.—Cal. Lyra *Linn.* Syst. i. 433. *Penn.* Brit. Zool. iii. 164. *Don.* Brit. Fishes, t. ix.—*E*, Yellow Gurnard, Rotchet, Illeck; *S*, Chanticleer, Gowdie. —Not uncommon.

Length 12 inches. Body, splendidly adorned with blue, yellow and white; rounded, smooth. Gill-covers spinous. Mouth wide. The last rays of the dorsal and anal fins longest. 1. D. 4, 2. D. 9, P. 20, V. 5, A. 9, C. 10.—Mr Neill (Wern. Mem. i. 529) having observed this fish invariably a male, was led to conclude, that the Sordid Dragonet, *C. Dracunculus* (Will. Ich. 136.) was the female, an opinion probably correct, since the latter differs only in the first ray of the dorsal fin being shorter, the body smaller, and the colours less brilliant.

Gen. LXII. ANARHICHAS. Wolf-fish.—Mouth armed with conical incisors, and flat grinders.

127. A. *Lupus.*—Body, above, greyish, beneath, yellowish, with irregular waved transverse bands of a darker colour.

Lupus marinus, *Sibb.* Scot. 25. *Will.* Ich. 130.—A. L. *Linn.* Syst. i. 430. *Penn.* Brit. Zool. iii. 151.—*S*, Cat-fish.—Frequent in the German Ocean.

Length from 2 to 3 feet. Head depressed; body compressed, smooth. The dorsal fin extends the whole length of the back, 73-rayed. P. 18, A. 46, C. 16, rounded.—This species feeds on *Univalve*, *molluscous* and crustaceous animals, and it constitutes excellent food, when boiled.

Gen. LXIII. CRENILABRUS. Wrasse.—The distal free margin of the preopercule denticulated.

128. C. *Tinca.* Common Wrasse.—Back nearly straight, descending gradually to the mouth.

Turdus vulgatissimus, *Will.* Ich. 319.—Goldsinny, *Jago*, *Ray*, Pisc. 163. —Labrus Tinca, *Linn.* Syst. i. 477.—Ancient Wrasse and Goldsinny, *Penn.* Brit. iii. 244, 251.—Goldsinny, *Don.* Brit. Fishes, t. lxxii.—*E*' Old Wife; *S*, Brassy.—English and Scotch coast.

Length about a foot. Body very variable in its colouring, more or less red, variegated with blue and yellow. Mouth ascending; front teeth conical, lengthened, incurvated. D. $\frac{17}{7}$, P. 14, V. $\frac{1}{5}$, A. $\frac{3}{7}$, C. 18. The last rays of the dorsal fin in the rest of the group elongated.—In some varieties there is a black spot on the tail, and another at the beginning of the dorsal fin, constituting the Goldsinny of Jago.

129. C. *gibbus*. Gibbous Wrasse.—Back arched, carinated; descending suddenly to the mouth.

Penn. Brit. Zool. iii. 250.—Anglesea.

Length 8 inches. Body with blue, orange, black, and green spots and stripes; above each eye, a dusky semilunar spot. D. $\frac{16}{9}$, P. 13, V. $\frac{1}{5}$, A. $\frac{3}{11}$. —Pennant is the only naturalist who has noticed this species.

GEN. LXIV. LABRUS. BERGIL.—Margin of the preopercle entire.

130. L. *Balanus*. Body oblong, red, with spots and stripes of blue and orange.

Ballan Wrasse, *Penn.* Brit. Zool. iii. 246.—Labrus Tinca, *Don.* Brit. Fishes, t. lxxxiii.—Rocky shores.

Length about 18 inches. D. $\frac{20}{11}$, P. 14, V. $\frac{1}{5}$, A. $\frac{3}{9}$. This fish, from the variable colour which it exhibits, has been described under different names. When marked on the sides with parallel longitudinal blue and olive stripes, it is the Striped Wrasse of Pennant (Brit. Zool. iii. 249., and of Donovan, t. xxi.) Those having two dark spots at the base of the dorsal, and a third between the dorsal fin and the tail constitute the Trimaculated Wrasse of Pennant, Brit. Zool. iii. 248., and of Donovan, Brit. Fishes, t. xlix. This variety is probably also the Bimaculated Wrasse of Pennant, Brit. Zool. iii. 247., found by Mr Brunich, at Penzance, and referred by him to the *L. bimaculata* of Linnæus.—In Orkney, where this species is called Bergil, it is esteemed as food.

131. L. *Comber*.—Beneath, and parallel with the lateral line, a smooth even silvery stripe from the gills to the tail.

Comber, *Jago*, *Ray*, Pisc. 163? *Penn.* Brit. Zool. iii. 252.—Cornwall.

"It was of a slender form. The dorsal fin had twenty spiny, eleven soft rays: The pectoral fourteen: the ventral five: the anal three spiny, seven soft. The tail rounded. The colour of the back, fins and tail, red: the belly yellow," Pennant.

132. L. *lineatus*.—Body green, with numerous yellowish longitudinal lines.

Don. Brit. Fishes, t. lxxiv.—Cornwall.

Length 7 inches. D. $\frac{20}{10}$, P. 14, V. 8, A. $\frac{3}{8}$, C. 15. A specimen was taken on the Cornish coast, by Captain Bray, which Donovan has delineated.—It is provincially known by the name of Green Fish.

133. L. *Coquus*. Cook.—Back purple, belly yellow.

Jago, *Ray*, Pisc. 133.—Cornwall.

The first notice of this species is by Mr Jago: "Dorso est purpureo et indico, ventre flavescente: squamosus est, et ad longitudinem 10 digitorum plus minus accrescit. Magna copia interdum capiuntur." In the last edition of the British Zoology (1812), it is added: "Among the drawings of fishes caught near Penzance, the editor has received one of a species of Wrasse called at Cornwall the *Cuckoo-fish*, and which may probably be the Cook Wrasse of Ray. The head is large, and slopes rapidly to the nose; the mouth large; the lips fleshy; the teeth few and sharp; the pupil of the eye dark, the irides yellow; the dorsal fin straight, the rays extending rather beyond the web, and are thirty-one in number, twenty-two of which appear soft, and are of a yellow colour; the fore part of the fin a bright blue, tipt with yellow; the colour of the head blue, mottled with olivaceous; the same tints extend to about one-third of the upper part of the back, and below the lateral line to the tail, which is slightly rounded; the remainder of the back deep orange, the belly of a lighter shade; the tail azure; the anal and ventral fins yellow, tipt with blue; the upper part of the pectoral fin blue; the lower yellow. This species is said to grow to the length of one foot," iii. 341.

GEN. LXV. JULIS.—Cheeks and gill-covers destitute of scales.

134. J. *vulgaris.*—Above fuscous-green: beneath white, with a fulvous dentated stripe on each side; two fore-teeth longest.

Labrus Julis, *Linn.* Syst. i. 476. *Don* Brit. Fishes, t. xciv.—Cornwall.

Length 7 inches. Form elongated. D. $\frac{9}{13}$, P. 12, V. $\frac{1}{5}$, A. ${}_{1}\frac{2}{3}$, C. 13. A specimen procured by Miss Pocock, on the coast of Cornwall, in 1802, was communicated to Mr Donovan.—It is common in the Mediterranean.

GEN. LXVI. BRAMA.—Teeth slender, numerous; front abrupt. Breadth of the dorsal and anal fins extended at their commencement. Tail lunate.

135. B. *marina.*—Bluish silvery; two teeth in the lower jaw produced.

B. mar. cauda forcipata, *Johnson*, Will. Ich. 17.—Toothed Gilt-head, *Penn.* Brit. Zool. iii. 243. *Mont.* Lin. Trans. vii. 292.—Sparus Raii, *Don.* Brit. Fishes, t. xxxvii.—Rare on the English coast.—Occasionally in the Frith of Forth.

Length upwards of 2 feet, depth about 1 foot; slender towards the tail. The dorsal and anal fins extended. D. 37, P. 24, V. 7, A. 31, C. 25. This species has received by different authors various appellations. It is *Sparus Raii* of Bloch, *S. castaneola* of Lacepede, *S. Raii* and *S. castaneola* of Shaw, *S. niger* of Turton, and *S. dentatus* of Stewart.

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As connected with this section, the CHÆTODON noticed in Cornwall by Mr Couch, merits a place, though too imperfectly described, to permit its insertion in any of the modern genera into which that group is now divided. "Only one specimen of this genus has come within my notice. This was taken at Looe, swimming alive on the surface of the water, in August 1821; and as I have not been able to refer it to any described species, I subjoin a description: It was about 17 inches long, and, exclusive of the dorsal fin, 5½ inches deep; the snout was blunt, sloping suddenly above the eyes; the angle of the mouth depressed; the teeth numerous, sharp, incurved, four in front of the under jaw very long; the body deep, thin; two dorsal fins, the first having flexible rays; the second long and narrow; tail very deeply lunated; the pectorals long; the ventrals double, or having a wing, by which means it seemed to have four ventral fins; the anal fleshy, and somewhat expanded, at the origin, obscure in its progress towards the tail; no lateral line; a broad band from eye to eye; the colour blue, deeper on the back than on the belly; covered with large scales, as well the body as the fins, so that the dorsals and anals seem like an extension of the body. I was unable to count the rays of the dorsal fins." Lin. Trans. xiv. 78.

GEN. LXVII. SPARUS. GILTHEAD.—Four or six teeth in each jaw, in one row; the rest of the jaws paved with large round teeth, with blunt summits.

136. S. *aurata.*—Between the eyes a semilunar gold-coloured spot.

Aurata Rondeletii, *Will.* Ich. 307.—S. aur. *Linn.* Syst. i. 467. *Penn.* Brit. Zool. iii. 240. *Don.* Brit. Fishes, t. lxxxix.—Near bold rocky shores.—Not common.

Length upwards of 18 inches. Back dusky-green, belly silvery; a black spot at the origin of the lateral line, and another on the gill-cover. Body thickest over the pectoral fin. Posterior nostril ovate, oblique, and near the eye. D. $\frac{11}{14}$, P. 15, V. $\frac{1}{5}$, A. $\frac{3}{12}$. Six conical teeth in each jaw produced. Inner arch of the gills with short round processes, rough on the surface. Stomach with three cæca.—This species seems to be more frequent on the southern shores than to the north. I have seen it once caught in the estuary of the Tay, in August.

GEN. LXVIII. PAGRUS. BRAIZE.—Teeth in front, numerous, in several rows.

137. *P. vulgaris.* Common Braize.—Body red; divisions of the tail equal.

P. Rondeletii, *Will.* Ich. 312.—Sparus Pagrus, *Linn.* Syst. i. 469. *Penn.* Brit. Zool. iii. 242.—*E*, Becker, Sea-Bream; *S*, Braize.—Common on south coast of England and west of Scotland.

Length about 18 inches. A dark spot at the base of the pectorals. D. $\frac{12}{13}$, P. 16, V. $\frac{1}{6}$, A. $\frac{2}{12}$. Irides silvery; mouth red within.

138. P. *lineatus.*—Dusky blue, with pale longitudinal lines; upper division of the tail largest.

Sparus lin. *Mont.* Wern. Mem. ii. 451. t. xxii.—Coast of Devon.

Length about 15 inches. Body more compressed and arched, and the fins broader, and the eye smaller than in the preceding. Irides dusky and silvery. This species is taken near the shore by hook or net, along with the preceding, in considerable abundance.—This is probably the species to which Mr Couch refers, under the title *Sparus Vetula*, or Old Wife, (Lin. Trans. xiv. 79. and of which he gives the following description:—" The body is deep, compressed, and has a considerable resemblance to the S. Pagrus (*P. vulgaris*); the lips are fleshy, and the jaws furnished with a pavement of teeth, of which those in front are the longest; the gill membrane has five rays; the gill-covers and body are covered with large scales. The ten first rays of the dorsal fin are spinous; the anal fin also has four spinous rays, after which it becomes more expanded; the tail is concave.—This fish has a membranous septum across the palate, as in the Wrasse genus. When in high season the colour behind the head is a fine green, towards the tail it is a reddish orange. The belly has a lighter tinge of the same colour. When out of season, the whole has a dusky lead colour. It weighs about three pounds."

GEN. LXIX. DENTEX. — Fore-teeth produced, hooked, with smaller ones behind; on the sides a row of conical teeth.

139. D. *vulgaris.*—Body silvery, fins yellow or red.

Sparus Dentex, *Linn.* Syst. i. 471. *Don.* Brit. Fishes, t. lxxiii.—On the coast of Sussex.

Length upwards of 2 feet. The back and sides have a tinge of red, the belly of yellow, with fuscous clouds. D. $\frac{11}{9}$, P. 12, V. 5, A. $\frac{3}{7}$, C. 19.—An example of this fish was procured by Donovan from the Billingsgate market, 9th April 1805.

GEN. LXX. SERRANUS. *(Cuvier.)*—Head scaly. Margin of the preopercle dentated; the opercle spinous.

140. S. *Norvegicus.*—Preopercle with five teeth. Scales with denticulated margins.

Perca marina, *Sibb.* Scot. 24. *Linn.* Syst. Nat. i. 483.—P. Norvegica, *Fab.* Fauna, Gr. 167. *Penn.* Brit. Zool. iii. 258.—Not common.

Length about a foot. Body oblong, compressed, reddish above; belly white. Mouth large. Teeth small, numerous. Head depressed. Suborbitars dentated; spines on the head above the eye; opercle pointed, with two strong spines. D. $\frac{15}{14}$, P. 18, V. $\frac{1}{5}$, A. $\frac{3}{7}$, C. 18. The soft rays of the dorsal fin produced. Tail nearly even.—The late Dr Skene observed this fish on the Aberdeenshire coast. In Zetland, where I have found it, it is termed *Bergylt*, or Norway Haddock.

GEN. LXXI. CERNUA. RUFF.—Head pitted, without scales. Preopercle dentated; opercle with a spine.

141. C. *fluviatilis.* Common Ruff.—Back and sides yellowish-green, with black spots.

Merr. Pin. 190. *Will.* Ich. 334.—Perca cernua, *Linn.* Syst. i. 487. *Penn.* Brit. Zool. iii. 259. *Don.* Brit. Fishes, t. xxxix.—In rivers in England.

Length about 6 inches. Scales with denticulated margins. Mouth small, teeth numerous. D. $\frac{14}{12}$, P. 15, V. $\frac{1}{6}$, A. $\frac{2}{6}$. Tail formed with transverse bands. Gregarious, spawning in March, and frequenting deep water.

The *Black Fish* of Mr Jago approaches the ruff in form, but the short description which he has left, and the manufactured figure which Borlase has published, render it impossible to identify the species at present. *Bor. Corn.* p. 271. tab. xxvi. f. 8.

GEN. LXXII. PERCA. PERCH. — Snout short, without scales. Preopercle dentated, opercle spinous. Teeth numerous. Scales denticulated.

142. P. *fluviatilis.* Common Perch.—Opercle with one spine: the first dorsal fin longer than the second.

Perca, *Merr.* Pin. 190. *Sibb.* Scot. 25.—P. fluv. *Will.* Ich. 291. *Linn.* Syst. i. 481. *Penn.* Brit. Zool. iii. 254.—In lakes and pools.

Length about a foot. Back arched, greenish-black, sides with five transverse black bands; belly reddish-white, ventral, anal, and caudal fins, red. Irides golden. 1. D. $\underline{14}$, 2. D. $\underline{14}$, P. 12, V. $\frac{1}{5}$, A. $\frac{2}{9}$. Tail lunate. Spawns in June.—This fish is occasionally found in estuaries, having been carried by floods from its ordinary haunts.

143. P. *Labrax.* Basse.—Opercle with two spines: dorsal fins of equal length.

Lupus Rondeletii, *Will.* Ich. 271.—Perca Lab. *Linn.* Syst. i. 482. *Penn.* Brit. Zool. iii. 257. *Don.* Brit. Fishes, t. xliii.—On the coast, and in estuaries, not frequent.

Length 18 inches. Body oblong, bluish-black above, silvery below. Nostrils with two continuous circular openings. Irides clouded silvery. 1. D. $\underline{9}$, 2. D. $\underline{12}$ P. 18, V. $\frac{1}{4}$, A. $\frac{11}{3}$, C. 18, slightly forked. Stomach with a process and three pyloric cæca; intestine with one fold.

GEN. LXXIII. SCIÆNA.—Snout produced, scaly. Preopercle dentated, opercle spinous.

144. S. *Aquila.*—Scales large, oblique, silvery: dorsal, pectoral, and ventral fins, red.

Cuv. Regne An. ii. 298.—Perca Vanloo, *Risso*, Ich. Nice. p. 298. t. ix. f. 30.—Zetland.

Length above 3 feet. Nose rounded; jaws equal. Teeth separate, sharp, hooked. Irides golden. 1st D. 10, 2d 27; P. 17; V. $\frac{1}{5}$; A. $\frac{2}{7}$; c. 20. The anal fin is small, and the tail is even. M. Cuvier states, that the air-bag is large, with numerous lateral processes.—A specimen of this fish, caught off Uyea in Northmavine, Zetland, in November 1819, and which was sent to Mr Neill in 1820, is the only example of its appearance on our shores. This specimen was 5 feet 4 inches in length: lateral line nearly straight, and at its termination at the tail forming a strong central scaly ray in that organ. Scales on the back large, 3 to 4 inches in circumference; of an irregular trapezoidal form, set on obliquely to the axis of the body. It was first observed by the fishermen endeavouring to escape from a seal. When taken into the boat, it made its usual purring sort of noise. Mr Neill has recorded, (Edin. New Phil. Journ. No. I.) some notices respecting the capture, and the appearances exhibited by the specimen, which came into his possession in too mutilated a state to permit him to give its characters in detail. It is common in the Mediterranean. Is this the fish referred to by Mr Couch as the Stone Basse, which approaches the shores of Cornwall, following pieces of wood covered with Bernacles?—*Linn.* Trans. xiv. 81.

GEN. LXXIV. TRACHINUS. WEAVER.—Body lengthened; head compressed. 1 spine on the opercle; 2 in front of the eye: dorsal and anal fins long.

145. T. *Draco.* Common Weaver.—Pectorals and tail rounded. Head ascending.

Araneus, *Merr.* Pin. 187.—Draco marinus, *Sibb.* Scot. 24. *Will.* Ich. 288.—English coast.

Length about a foot. Above yellowish, beneath silvery; the sides with two or three longitudinal and numerous transverse yellow lines. Throat sloping; back straight, belly prominent. 1st D. 5, 2d 25; P. 15; V. 6; A. 25; C. 10. The first dorsal fin is black; and the wound made by its spines is said to be very painful.

146. T. *major.* Greater Weaver.—Tail even; pectorals emarginate; head sloping.

Penn. Brit. Zool. iii. 171. *Don.* Brit. Fishes, t. 107.—English coast.

Length 11 inches. Body lengthened; scales disposed obliquely, with lines of yellow and black in the same direction. 1st D. 5, 2d D 32; P. 14; V. 5; A. 32; C. 13. This fish is occasionally brought to the London market in spring.

GEN. LXXV. LOPHIUS.—Body without scales; mouth wide; snout with two osseous flexible moveable tentacula.

147. L. *piscatorius.* Angler.—Head depressed, teeth numerous; chin bearded.

Rana piscatrix, *Merr.* Pin. 186. *Sibb.* Scot. 24. *Will.* Ich. 85.—Loph. pisc. *Linn.* Syst. i. 402. *Penn.* Brit. Zool. iii. 120. *Don.* Brit. Fishes, t. 101.—*E*, Monk, Toad, Nass, Devil fish, Frog-fish; *S*, Wide-gab; *N*, Marool.—Common in the North Sea.

Length 3 to 5 feet. Body broad in front, slender towards the tail; brown above, white beneath. Under jaw longest. Nostrils on the inside of the mouth. Eyes coronal, irides white, radiated with black. Pectorals large, on footstalks; the gill covers concealed, aperture small. 1st D. 4, 2d D. 14; P. 27; V. 5; A. 8; C. 8. The sides have fleshy filaments. The skeleton is cartilaginous. The Mountsbay Angler of Borlase (Corn. 266. t. 27. f. 6.), and the one from Bristol (Phil. Trans. liii. p. 170. t. 13.), appear to be only the common Angler, the specimens having been more or less mutilated.

GEN. LXXVI. TRIGLA. GURNARD.—Three detached rays at the base of the pectorals.

* *Pectorals large, reaching beyond the vent.*

148. T. *Hirundo.* Sapphirine Gurnard.—Pectoral fins rich green and blue; lateral line rough.

Hirundo, *Will.* Ich. 280.—T. Hir. *Linn.* Syst. i. 497. *Penn.* Brit. Zool. iii. 280.—*E*, Tub.—South coast of England, rare in Scotland.

Length about a foot. Body slender; back greenish, belly white; sides reddish; pupil green. A row of spines on each side of the dorsals at the base. 1st D. 9 (the second ray longest), 2d D. 18; P. 10; V. $\frac{1}{5}$; A. 19; C. 10.

149. T. *lævis.* Smooth Gurnard.—Pectorals clouded with blue and red; lateral line elevated, smooth.

Mont. Wern. Mem. ii. 455.—*E*, Yillock.—Coast of Devon.

Length 2 feet. Yellowish-brown above, tinged with red; belly white. Snout slightly bifid, denticulated. Back slightly serrated at the base of the dorsals. 1st D. 9, 2d D 16; P. 9; V. 6; A. 15. The 2d ray of the first dorsal perceptibly longest. Tail nearly even.—This species is taken by the hook, and by shore-nets at Torcross; and, by the fishermen, confounded with the preceding.

** *Body with fine transverse thread-like ridges.*

150. T. *adriatica.*—Lateral line with large serrated spines.

Mullus imberbis, *Will.* Ich. 278.—Cuculus lineatus, *Jago*, Ray Pisc. 165. T. lineata, *Don.* Brit. Fishes, t. 4.— T. ad. *Risso*, Ich. 2.—South coast of England.

Length about a foot. Body red above, beneath white. Transverse ridges pass from the back across the lateral line, and become ramose on the belly. Nose bifurcated with small spines. Base of the dorsal fins spinous. 1st D. 10, 2d D. 17; P. 10; V. 6; A. 15; C. 16.—This species, which appears to have been first described by Brunnich under the above title, and afterwards by Lacepede as T. *lastoviza*, is recorded by Donovan as a native of the British seas.

151. T. *lineata.*—Lateral line simple; the second ray of the first dorsal fin large and produced.

Mont. Wern. Mem. ii. 460.—Coast of Devon, common.

Length 15 inches. Body, above, red, clouded with brown; beneath white. Snout slightly bifid and crinated. The transverse ridges confined to the region of the lateral line. Base of the dorsal fin spinous. 1st D. 9, 2d D. 18; P. 10; V. 6; A. 18. Taken by whiting bait, and shore-nets. First noticed by Montagu, who considers the great length and thickness of the second ray of the dorsal fin the best mark of discrimination.

*** *Pectorals and sides common.*

152. T. *Gurnardus.* Grey Gurnard.—Above grey, clouded; beneath, silvery; nose bifurcated with three spines on each side.

Cuculus, *Merr.* Pin. 186.—Lyra, *Sibb.* Scot. 24.—Gornatus, *Will.* Ich. 279.—T. Gurn. *Linn.* Syst. i. 497. *Penn.* Brit. Zool. iii. 276.—*S*, Crooner.—Common.

Length about 18 inches. Eyes large; cheeks finely striated. Lateral line broad, and, with the base of the dorsal fin, serrated. The three first rays of the dorsal fin tuberculated. 1st D. 8, 2d D. 19; P. 10; V. $\frac{1}{5}$; A. 19.—Easily taken with a hook.

153. T. *Cuculus.* Red Gurnard.—Body red; the first dorsal fin with a black spot.

A Rotchet, *Merr.* Pin. 186.—Cuculus, *Will.* Ich. 281.—T. cuculus, *Penn.* Brit. Zool. iii. 278.—Coast of Cornwall common.

Length about 1 foot. Nose with three spines on each side. Lateral line strongly serrated. The two first rays of the dorsal fin rough. 1st D. 7, 2d D. 19; P. 10; V. 6; A. 18. The pectorals are bluish, the ventrals and anal white.

154. T. *Lyra.* Piper.—Red; snout divided into two dentated processes.

Tub, *Merr.* Pin. 186.—Lyra, *Will.* Ich. 282.—T. Lyra, *Linn.* Syst. i. 496. *Penn.* Brit. Zool. iii. 279. *Don.* Brit. Fishes, i. 118.—Coast of England.

Length 2 feet. Lateral line nearly smooth; base of the dorsals spinous. 1st D. 10, 2d D. 18; P. 12; V. 1; A. $\frac{1}{15}$. Lower jaw much shorter than the upper.

Gen. LXXVII. CATAPHRACTUS. Pogge.—Body angular; mailed with large spinous scales; bearded.

155. C. *Schoneveldii.* Common Pogge.—Snout armed with four recurved spines.

Sibb. Scot. 25. *Will.* Ich. 211.—Cottus Cat. *Linn.* Syst. i. 451. *Penn.* Brit. Zool. iii. 217.—*S*, Lyrie, Sea Poacher, Pluck, Noble.—Common on the coast.

Length 5 inches. Head large, subtriangular; chin with numerous cirri. Body angular, with pointed scales. 1st D. 5, 2d D. 7; P. 18; V. 3; A. 6; C. 10. Tail rounded; the body growing slender to its base.

Gen. LXXVIII. COTTUS. Hardhead.—Body smooth, without appendages at the pectorals or chin. Head armed with spines.

156. C. *Scorpius.* Father-Lasher.—Preopercle with two spines; one in front of the eye.

Scorpius marinus, *Sibb.* Scot. 24.—Scorpæna Bellonii, *Will.* Ich. 138.—Cottus Scorpius, *Linn.* Syst. i. 452. *Penn.* Brit. Zool. iii. 218.—*E*, Sea Scorpion; *S*, Lucky-Proach.—Common near rocky coasts.

Length 9 inches. Colour yellowish-brown, with dark spots and clouds. Mouth large, upper jaw longest. Opercle with one strong spine. Lateral line straight near the back, and rough. 1st D. 9, 2d D. 13; P. 14; V. 3; A. 10; C. 14.—This species is sometimes used as food.

157. C. *Gobio.* Bullhead.—Preopercle with one spine. First dorsal fin small, coloured.

Gobio capitatus, *Merr.* Pin. 190. *Will.* Ich. 137.—Cottus Gobio, *Linn.* Syst. i. 452. *Penn.* Brit. Zool. iii. 216.—*E*, Miller's Thumb.—Rivers in England.

Length 4 inches. Body dusky, clouded with yellow, belly whitish. Head broad and flat; eyes small; irides yellow. Lateral line near the middle of the body, smooth. 1st D. 6, 2d D. 17; P. 13; V. 4; A. 13; C. 12.—This species is found in clear brooks, depositing its spawn in a hole in the gravel.

Gen. LXXIX. MULLUS. Surmullet.—Chin with two beards. Gill-membrane of three rays. Head sloping, with large scales.

158. M. *Surmuletus.* Striped Surmullet.—Sides with longitudinal lines of yellow.

M. major, *Will.* Ich. 285.—H. Sur. *Linn.* Syst. i. 496. *Penn.* Brit. Zool. 274. *Don.* Brit. Bishes, t. 12.—South coast of England.

Length upwards of a foot. Body tinged with red; white on the belly.

Eyes large; irides purple. 1st D. 7, 2d D. 9; P. 16; V. 7; A. 8; C. 20.—The tail is much forked.

In reference to the Red Surmullet, M. *barbatus*, which for some time has occupied a place in the British Fauna, it may be stated, that its claim rests on the following vague remark of Mr Pennant. "We have heard of this species being taken on the coast of Scotland, but had no opportunity of examining it; and, whether it is found on the west of England with the other species, or variety, we are not at this time informed."—Brit. Zool. iii. 273. No notice, however, is taken of this fish in the list of Scottish animals prefixed to Lightfoot's Flora Scotica, and composed by Mr Pennant.

Gen. LXXX. MUGIL. Mullet.—Suborbitals denticulated on the margin. Middle of the under jaw with a ridge, with a corresponding groove in the upper. Gill-flap of 6 rays.

159. M. *Cephalus*. Common Mullet.—Sides with broad longitudinal lines on a silvery ground.

Will. Ich. 274. *Linn.* Syst. i. 520. *Penn.* Brit. Zool. iii. 329. *Don.* Brit. Fishes, t. 15.—In the sea and estuaries.

Length upwards of 18 inches. Back dusky; belly silvery. Irides dusky. Vomer, palatines, and tongue, with small teeth. 1st D. 4 (with large scales at the base), 2d D. 9; P. 17; V. $\frac{1}{5}$ (with a triangular process on each side, and one in the middle); A. $\frac{3}{9}$. Tail forked; peritoneum black. When enclosed in a net they endeavour to effect their escape by leaping over the edges, which they do with great agility.

Gen. LXXXI. ATHERINA.—Jaws protrusile. Cheeks with scales.

160. A. *Hepsetus*. Atherine.—Side with a silvery longitudinal stripe: margin of the dorsal scales with black dots.

Pisciculus anguella, *Will.* Ich. 209.—A. Hep. *Linn.* Syst. i. 519. *Penn.* Brit. Brit. Zool. iii. 318. *Don.* Brit. Fishes, t. 87.—*E.* Smelt, Melet.—In the sea and estuaries.

Length 5 inches. Body, above, yellowish-brown, silvery beneath; pellucid. Head broad, depressed, with a mesial ridge. 1st D. 8, 2d D. 11; P. 13; V. 6; A. 14-17; C. 15. Spawns in June.

Gen. LXXXII. SCOMBER. Mackerel.—Posterior portions of the second dorsal and anal fins subdivided into spurious finlets.

161. S. *vulgaris*. Common Mackerel.—Five spurious fins above and below. Second dorsal and anal fins triangular.

S. *Merr.* Pin. 187. *Sibb.* Scot. 24. *Will.* Ich. 181.—S. Scomber, *Linn.* Syst. i. 492. *Penn.* Brit. Zool. iii. 264. *Don.* Brit. Fishes, t. 120.—British Seas common.

Length 15 inches. Body compressed, angular and slender towards the tail; bluish green above, with dark transverse bands; beneath silvery. 1st

D. 10, 2d D. 13; P. 13; V. 6; A. 11; C. 22. The tail is forked. Easily taken by a bait on the surface in a breeze.—A gregarious fish; and, like the herring, approaches the shores to spawn.

162. S. *Thynnus.* Tunny Mackerel.—Eight spurious finlets above and below. Second dorsal and anal fins falcate.

Thunnus, *Sibb.* Scot. 23. *Will.* Ich. 176.—S. Th. *Linn.* Syst. i. 493. *Penn.* Brit. Zool. iii. 266. *Don.* Brit. Fishes, t. v.—*E*, Spanish Mackerel; *S*, Stoer Mackerel.—Rare in England, frequent on the west coast of Scotland.

Length about 3 to 7 feet. Body round, slender and angular towards the tail; black above, silvery beneath, tinged with purple. 1. D. 14, 2d D. 14; P. 34; V. 6; A. 13. Tail lunate.—This species feeds on herrings and pilchards.

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According to Mr Stewart, the S. *Pelamis* "has been taken, though rarely, in the Frith of Forth."—Elements, i. p. 363.

Gen. LXXXIII. TRACHURUS. Scad.—Dorsal and anal fins entire. A row of large imbricated spinous scales on the lateral line.

163. T. *vulgaris.* Common Scad.—Body variegated, blue and green; the belly white.

Will. Ich. 290.—Scomber Trach. *Linn.* Syst. 494. *Penn.* Brit. Zool. iii. 269.—Horse-Mackerel.—Rare.

Length 15 inches. Lower jaw longest; no teeth; eyes large, irides silvery. The lateral line with a curve; the broad scales are produced into a spine in the middle of the free edge, the rest of the margin denticulated; smaller scales between. 1st D. 8, 2d D. 34; P. 20; V. 6. Tail forked.—Willoughby, Pennant, and Donovan, mention the occurrence of this fish on the English coast. I found a mutilated example cast ashore in the estuary of the Tay, June 1823.

◆

Mr Couch adds, in reference to the T. *glaucus*, or Abacore, as a native of the Cornish seas; "I believe this fish is not uncommon in the summer; but keeping at a distance from the shore, and seldom taking a bait, is but rarely taken."—Linn. Trans. xiv. 82.

Gen. LXXXIV. ZEUS. Doree.—Two anal fins. Jaws protrusile; gape wide. The spinous portions of the dorsal and anal fins divided from the cartilaginous by a depression. Ventrals thoracic.

164. Z. *Faber.*—Spinous rays of the first dorsal with long filaments.

Faber, *Merr.* Pin. 187. *Will.* Ich. 294.—Zeus Faber, *Linn.* Syst. i. 454. *Penn.* Brit. Zool. iii. 221. *Don.* Brit. Fishes, t. 8.—On the English coast.

Length 17 inches. Body oval, compressed, olive, blue, and white, with a round black spot on the side. 1st D. 10, 2d D. 24; P. 14; 1st A. 4, 2d A. 22; C. 14. Tail round. Spinous scales on the back and belly, at the base of the fins. Lateral line waved.—Willoughby mentions this fish as common in Cornwall. It is occasionally brought to the London market.

GEN. LXXXV. SPINACHIA.—Lateral line armed with large pointed imbricated scales. Ventrals, of a single ray, supported by a spinous shield.

✓165. S. *vulgaris.*—Back with fifteen spines.

Aculeatus marinus major, *Sibb.* Scot. 24. *Will.* Ich. 340.—Gasterosteus Spin. *Linn.* Syst. i. 492. *Penn.* Brit. Zool. iii. 263. *Don.* Brit. Fishes, t. 45.—In the sea rare.

Length 6 inches. Snout produced; mouth tubular; teeth small. 2d D. 7, P. 10, A. $\frac{1}{7}$, C. 12. Tail even at the end.

GEN. LXXXVI. GASTEROSTEUS. STICKLEBACK.—Ventrals of a single spine; the bone of the pelvis forming an intervening shield, pointed behind.

✓166. G. *P. aculeatus.*—Three spines on the back; scales on the sides large, transverse.

Pungitius, *Merr.* Pin. 189. *Sibb.* Scot. 25.—Pisciculus aculeatus, *Will.* Ich. 341. Gast. acul. *Linn.* Syst i. 489. *Penn.* Brit. Zool. iii. 261. *Don.* Brit. Fishes, t. xi.—Common in rivulets, ditches, and lakes.

Length 2 inches. Body square near the tail. 2d D. 11, P. 10, A. $\frac{1}{9}$, C. 12. A voracious fish. Spawns in April. Sometimes found in estuaries, after floods, where it attains a large size.

✓ 167. G. *Pungitius.*—Ten spines on the back; sides smooth.

Piscis aculeatus minor, *Will.* Ich. 342.—G. Pung. *Linn.* Syst. i. 491. *Penn.* Brit. Zool. iii. 262. *Don.* Brit. Fishes, t. 32.—In the sea and rivers.

Length about an inch and a half; olive above, white below. Dorsal spines irregular in their direction. 2d D. 9, P. 9, A. $\frac{1}{9}$. Tail rounded.

* * *

Mr Couch states in reference to the *Centronotus ductor*, or Pilot-fish, that "Two of this species a few years since accompanied a ship from the Mediterranean into Falmouth, and were taken in a net."—Linn. Trans. xiv. 82.

GEN. LXXXVII. LAMPRIS. OPAH.—Snout short; ventrals abdominal.

168. L. *Luna.*—Fins red; body above greenish blue, with silvery spots.

Piscis maculis aureis aspersus, *Sibb.* Scot. t. vi. f. 3. *Wallace,* Ork. 37.—Opah, *Penn.* Brit. Zool. iii. 223. *Sower.* Brit. Misc. i. p. 45. t. 22. *Don.* Brit. Fishes, t. 97.—In the British seas rare.

Length from 3 to 5 feet. Mouth small, tongue thick and rough, with reflected prickles. Lateral line irregular. Pectorals long; the dorsal and anal fins falcate at their commencement. D. 54, P. 28, V. 10, A. 26, C. 30. Several examples of this splendid fish have, at different times, been captured in our seas, or cast ashore during storms.

GEN. LXXXVIII. XIPHIAS. SWORDFISH.—Snout sword-shaped. No ventral fins.

169. X. *gladius.* Common Swordfish.—Snout long, depressed. Anal and dorsal fins entire.

Xiphias, *Sibb.* Scot. 23. *Will.* Ich. 161.—X. Glad. *Linn.* Syst. i. 432. *Penn.* Brit. Zool. iii. 160.—X. Rondeletii, *Leach,* Wern. Mem. ii. 58. Occasionally captured in the British seas.

Length of the body from 6 to 15 feet, and of the snout from 2 to 3 feet. Colour dusky above, the belly white. Gape wide; the lower jaw short and pointed. The dorsal fin begins over the gills, suddenly reaches its greatest elevation, then becomes very low, until near the tail, when it suffers a slight elevation; the intervening low membrane is frequently lacerated, and has led several observers to conclude that this fish possessed two dorsal fins. The anal fin bears a near resemblance to the dorsal in shape. On each side of the body, at the setting on of the tail, there is an elevated ridge. In a specimen which I inspected, (Brewster's Journal, vol. ii. 187.), found in the Tay, the ridge on the left side was much more produced than on the right, and the same side of the body was of a darker colour; as if the fish in swimming did not always preserve a vertical position. The stomach contained numerous remains of the *Loligo sagittata*, and its mouth is so constructed as to be able to swallow entire objects, not to tear off morsels,—circumstances which induce me to call in question the accuracy of those who deem this fish as voracious and destructive to Tunnies in particular. Sibbald first noticed this fish as an inhabitant of our seas. Willoughby states his having seen them of 10 cubits. The snout of this fish has been supposed hard enough to penetrate the planks of ships. Mr Scoresby, in the Edin. Phil. Journ. vol. iii. p. 411., states an instance of a ship from the coast of Africa, the bow of which had been penetrated by a bone, which he considers as the snout of the sword-fish. The proportions and structure of this bone, as stated, intimate, that, if it be the snout of a Xiphias, it must have belonged to an individual of a species differing greatly from the common sort.

GEN. LXXXIX. CENTRISCUS.—Body oval; compressed; belly carinated; the first ray of the first dorsal fin a serrated spine.

170. C. *Scolopax.* Trumpet-Fish.—Scales small, rigid, pointed. Colour reddish.

Scolopax Rondeletii, *Will.* Ich. 160.—Centriscus Scol. *Bloch,* t. 123. f. i. *Don.* Brit. Fishes, t. 63. *Couch,* Lin. Trans. xiv. 89, and ib. viii. 358. —Occasionally on the south-western coasts of England.

Length about 4 inches. The snout occupies about one-third of the length of the fish. Eyes large, irides white, with a reddish tinge. 1st D. 4, 2d D. 9; P. 15; V. 7; A. 13; C. 15.—This fish may be considered as one of the rare kinds, but interesting as the only species we can claim to our Fauna of the interesting group to which it belongs.

In the preceding enumeration of British Fishes, I have taken notice of a few species which seem entitled only to the rank of stragglers, such as the Flying Fish, Remora, and a few others. The geographical distribution of these species is so far ascertained, that individuals occurring in particular places may, with some confidence, be regarded as having strayed from their ordinary haunts, and not likely either to remain permanently, or to multiply. But there are a few species, in the genera Wrasse and Gurnard, for example, which, though they have been seldom observed on our coasts, are still permitted to occupy a place in the British Fauna. The geographical distribution of these species is too little known to permit any accurate opinion being formed respecting their ordinary haunts. They may, probably, be found more frequently in our seas, as the products of our fishing boats are examined with more attention. In this department there is much which has been neglected, so that a rich harvest of discovery still awaits the zealous and practical cultivators of the science of Ichthyology who have access to extensive fishing stations.

The *revolutions* which have taken place in the different epochs of the earth's duration, and which have left memorials of their influence, in the numerous relics of extinct species which the different strata contain, have extended their destructive operations to fishes; an occurrence attested by the remains of teeth and vertebræ, and entire impressions of fish, exhibited by many strata. But those parts which have been preserved, exhibit so imperfectly the characteristic mark of the species, as to render it difficult, if not impossible, in the present state of ichthyological osteology, to give notices of their history at all calculated to interest the reader.

The circumstances which regulate the *physical distribution* of Fishes, appear as yet to be imperfectly determined. Living in a medium, less influenced by changes of temperature than the atmosphere, the mere action of heat exercises but little control. Yet it is probable that the attachment of the Pilchard to Cornwall and the Tusk to Zetland, may arise from this circumstance. Fish appear, however, to have peculiar local attachments, frequenting certain banks, shores, or tideways, in preference to others. Thus, the Hake and the Braize, while they are distributed along the south-western shores of England, and the coast of Ireland, are likewise extended, though less abundantly, to the Hebrides, while their northern limits on the east coast are much more circumscribed. Suitable food is probably the great regulator of these distributions.

The *migrations* of fishes, in compliance with the arrangements of their reproductive system, exhibit the most singular movements, often complex, but always useful to man. Those which inhabit the inaccessible depths of the sea, in ordinary cases, approach the shores, towards the season of spawning; and, after depositing their eggs in suitable situations, again retire to their inaccessible haunts. The fry occupy for a time their littoral birthplace, and then follow the course of the older individuals, though in several cases the young seem to execute movements different from the full grown fish. Not a few species, as the salmon, which have their ordinary residence in the sea, approach, towards the spawning season, the shores, enter estuaries and ascend rivers, where, having selected a suitable place, they deposite their eggs, and again return to the sea. The fry, after a certain period, likewise leave the fresh waters and betake themselves to the sea. Similar movements are executed by the fish which inhabits lakes. As the spawning season approaches, several species, as the Gwiniad, leave the deep water, and approach the margin; while others, as the Roach, not only approach the margin of the lake, but ascend the neighbouring streams.—With a few other species, as the Eel, for example, these movements are reversed; the spawning fish leave the fresh-water lakes and rivers, and retire to the sea to give birth to their progeny.

But there are other movements executed by fishes of a more anomalous character, the necessary conditions of which remain to be investigated. The Herring, Pilchard and Haddock, for example, after frequenting certain parts of the coast for many years, at stated intervals, suddenly withdraw themselves to other stations, to which they had not been accustomed to resort. It is probable that these shiftings of fish may depend on the movements of those animals on which they subsist, or on the changes in the quantity of food, occasioned by excessive consumption.

The *Fisheries* of this kingdom are objects of vast importance, yet, though they have frequently occupied the attention of Parliament, a great deal remains to be done before they be placed in that state of improvement of which they are susceptible. In point of importance, our fisheries probably rank in the following order: 1. *Gadusidæ*, or fisheries having for their object the capture of Cod, Coal-fish, Haddock, Ling, Hake, Tusk. 2. *Salmonidæ*, including Salmon, Trout, Char, and Smelts. 3. *Clupeadæ*, including Herring, Pilchard, Shad. 4. *Pleuronectidæ*, including Turbot, Holibut, Flounder, and Sole. 5. *Scomberoidæ*, or Mackerel. 6. *Raiadæ*, including Rays and Skates. 7. *Cyprinidæ*, including Carp, Bream, Tench, &c. 8. *Anguilladæ*, including the Eel and Conger.

To those interested in the improvement of these fisheries the following remarks may not be deemed out of place. 1. The fisheries sustain much injury in consequence of the capture of fish ready to spawn. No one can witness the exhibition of the large *roes* of the Cod, Ling, or Haddock, on the stalls of our fish-markets, without being convinced of the propriety of some legislative enactment (capable of application) to prevent this prodigal waste of our stores, by prohibiting the fishery of each species for a certain time, at the ordinary spawning season. 2. The fisheries are injured by the destruction which takes places in the *fry*, in consequence of the operations being carried on at improper seasons, or with improper engines. The injury done to the salmon-fishery by the destruction of the fry has been frequently stated to the public, but few seem to be aware of the vast extent of injury to the fry of many kinds of fish from the use of improper nets, by the trawlers of the Channel Fisheries. On this subject the reader will find some important remarks in Mr Cornish's "View of the present state of the Salmon and Channel Fisheries," Lond. 1824. 3. The fisheries might be extended and rendered more valuable by enlarging the system of *bounties*, or rather, perhaps, by directing them to new objects. The Turbot and Eel fisheries are neglected in many places where they might be prosecuted to advantage; and hundreds of our fresh-water lakes, which at present are useless and waste, might be rendered productive of much wholesome food. It becomes a question of great national importance, whether these, and other obvious improvements in our fisheries, might be most effectually promoted, by public *statutes*, or by *Boards* furnished with suitable powers.

The reader who wishes to consult accurate delineations of our native Fishes, should have recourse to the valuable plates of Donovan. Should minute description be the object of his search, the pages of Willoughby will not fail to gratify him.

INVERTEBRAL ANIMALS.

INVERTEBRAL ANIMALS.

I. GANGLIATA. — Brain surrounding the gullet, and sending out nervous filaments, which in their course expand into ganglia.

Class I. Mollusca.—Brain surrounding the gullet, and sending out filaments, which separate irregularly.

Class. II. Annulosa.—Brain surrounding the gullet, and sending out a knotted filament to the posterior extremity of the body.

II. RADIATA.—Nervous system obscure, disseminated, not appearing in the form of a collar round the gullet, nor of a longitudinal cord.

Although the Radiata appear here as the last of the Invertebral Animals, it is my intention to proceed to the consideration of the species which belong to the division immediately after the enumeration of the Mollusca. This course I am induced to follow, because an intimate relationship appears to subsist between certain groups of radiated and molluscous animals. Besides, by such an arrangement, the whole of the Annulose animals will remain connected, and occupy exclusively the second volume of this work.

MOLLUSCA.

ORDER I. MOLLUSCA CEPHALA.—Head distinct from the body, bearing the lips or jaws.

SECT. I. NATANTIA.—*Organs of progressive motion fitted for swimming.*

CEPHALOPODA.—Fins in the form of tentacula, surrounding the mouth. Marine.

NAUTILIDÆ.—With a multilocular shell.
SEPIADÆ.—Destitute of a multilocular shell.

SECT. II. GASTEROPODA.—*Organs of progressive motion fitted for creeping.*

I. PULMONIFERA.—Respiring in air by means of a single pulmonary cavity.

TERRICOLA.—Resident on land.

AQUATICA.—Resident in the water.

II. BRANCHIFERA.—Respiring in water.

NUDIBRANCHIA.—Branchiæ external, pedunculated, and plumose.

PECTINIBRANCHIA.—Branchiæ in the form of sessile, pectinated ridges, contained in a cavity.

ORDER II. MOLLUSCA ACEPHALA.—Destitute of a distinct head or neck.

SECT. I. CONCHIFERA.—*Covering testaceous.*

I. BRACHIOPODA.—Mouth with a spiral arm on each side, fringed with filaments.

PEDUNCULATA. Shell supported by a cartilaginous stalk.

SESSILIA. One valve of the shell cemented, fixed.

II. BIVALVIA.—Mouth destitute of spiral fringed arms.

ASIPHONIDA.—Cloak open, without syphons.

SIPHONIDA.—Cloak more or less closed, forming syphons.

SECT. II. TUNICATA.—*Covering soft.*

DICHITONIDA.—Inner tunic detached from the external one, and united only at the two orifices.

MONOCHITONIDA.—Inner tunic adhering throughout to the external one.

NAUTILIDÆ.

I. *Partitions of the chambers with simple margins, forming harmonic sutures.*

- *a.* Shell spiral.
  - *b.* Whorls discoid.
    - *c.* Last chambers produced.
      - Spirula.
      - Spirolina.
    - *cc.* Last chambers uniform.
      - *d.* Sides similar, the mouth mesial.
        - Nautilus.
      - *dd.* Sides dissimilar, convex above, flat beneath, the mouth lateral.
        - Rotalia.
        - Lobatula.
        - *Nummulita.*
  - *bb.* Whorls globular.
    - Vermiculum.
    - Arethusa.
    - Lagenula.
- *aa.* Shell produced.
  - Orthocera.
  - *Belemnita.*
  - *Conularia.*

II. *Partitions of the chambers with waved margins forming serrated sutures.*

- *a.* Spiral.
  - *b.* Spirally discoid.
    - *Ammonita.*
    - *Orbulita.*
    - *Scaphita.*
  - *bb.* Spirally turrited.
    - *Turrilita.*
- *aa.* Shell straight or bent.
  - *Baculita.*
  - *Amplexus.*

CEPHALOPODA.

NAUTILIDÆ.

GEN. I. SPIRULA.—Whorls regularly involute, separate; mouth orbicular; partitions concave, perforated by a proximal continuous pipe.

1. S. *australis*.—Shell with fine smooth whorls; partitions slightly depressed externally.

Nautilus exiguus, albus, pellucidus, teres, *Lister*, Conch. t. 550. f. 2.—Naut. Spirula, *Linn*. Syst. i. 1163.—*Turton*, Conch. Dict. 117.—West coast of Ireland.

Shell about an inch in breadth. The first chambers, at the apex, are a little inflated; but, as they gradually increase in size, in the outer whorls, their surface becomes more even, and the line of separation less distinct; partitions perlacious. The last chambers are nearly cylindrical, and produced in a straight line. According to Lamark, (Histoire Naturelle des Animaux sans Vertebres, vii. 600.), the shell is imbedded in the posterior extremity of the sac, a portion only of the last whorl being visible. The head is surrounded with eight arms and two feet. Two specimens of the shell of this animal were found on the strand between Kenmare Harbour and Ballyskellegs Bay, in the county of Kerry, by Mr O'Kelly of Dublin, in the summer of 1817. It is probable that the remains of many other animals, the ordinary inhabitants of the West Indian seas, will occasionally occur on the Irish coast, as in the present instance; but we have to determine their capability of *living* in our seas before their right to a place in our Fauna can be established. The claims of the present species are doubtful.

GEN. II. SPIROLINA.—Whorls contiguous.

2. S. *subarcuatula*.—Outer margin carinated; inner margin rounded; partitions of the chambers raised on the sides.

Naut. subarcuatus, geniculis exertis, *Walker*, Test. Min. t. iii. f. 73. *Mont*. Test. Brit. Sup. 80. t. xix. f. 1.—Sheppy Island, rare; Mr Walker.

Size about one-eighth of an inch. Chambers widest externally, making the margin of the mouth oblique; about twelve in number, the last four forming the produced portion. Syphon near the inner or proximal margin. When the produced portion is broken off, the remaining convoluted part is considered by Montagu as having been figured by Walker, at t. iii. f. 66.

3. S. *semilitua*.—Outer margin rounded; the partitions of the chambers raised on all sides.

Nautilus sem. *Mont*. Test. Brit. 196. Sup. 80. t. xix. f. 3.—Sandwich and Sheppy, Mr Boys.—Rare.

Colour opake brown. Chambers diminishing in size to the mouth, which is contracted. Syphon near the distal margin, produced. The partitions are represented in Montagu's figure as tuberculated, though this character is not noticed in the description.

4. S. *carinatula.*—Outer margin slightly carinated. Chambers increasing regularly in size.

N. oblongus carinatus apertura lineari ovali, *Walker*, Test. Min. t. iii. f. 72.—*Mont.* Test. Brit. 195.

Colour white, transparent. Chambers seven. The first globose. Montagu states, that the drawing of this shell, sent to him by Mr Boys, differs from the figure which Walker published,—an occurrence too frequent in the same quarter.

GEN. III. NAUTILUS.—Sides equal; the last whorl embracing and concealing the previously formed ones.

5. N. *crispus.*—Exteriorly carinated. Spaces between the partitions crenated. Sides convex.

Linn. Syst. i. 1162. *Walker*, Test. Min. t. iii. 65. *Mont.* Test. Brit. 187. t. xviii. f. 5.—Among old shells and corals.—Common.

Size about $\frac{1}{20}$th of an inch. Chambers in the last whorl about 20; the partitions flexuous, elevated, canaliculated. Mouth cordate; the aperture or syphon minute, near the proximal edge. In the young shells, the partitions are destitute of the gutter, and the margin is more rounded.

6. N. *calcar.*—Exteriorly carinated. Spaces between the partitions smooth. Sides convex.

Mont. Test. Brit. 189. t. xv. f. 4.—N. rotatus, *Turt.* Conch. Dict. 118.—On shells and corallines on the English coast.

Chambers in the last whorl 6; the partitions marked by elevated flexuous lines, which do not reach, however, to the carinated margin. Mouth semicordate, clasping.

7. N. *lævigatulus.*—Exteriorly subcarinated. Mouth with a rim. Sides convex.

N. spiralis geniculis lævibus, *Walker*, Test. Min. 19. t. iii. f. 67. *Mont.* Test. Brit. 188; Suppt. 75. t. xviii. f. 7–8.—English or Scottish shores.

Chambers about 10, glossy, smooth; the partitions marked by subelevated flexuous rays. Mouth triangular, with a rim which does not clasp the body whorl. Aperture near the distal edge. The mouth seems liable to vary in form, as in a specimen which I found in Zetland, in which it is rounded and turned to one side.

8. N. *depressulus.*—Depressed, exteriorly rounded; the chambers and partitions nearly even.

N. spiralis utrinque subumbilicatus geniculis depressis plurimis, *Walker*, Test. Min. 19. t. iii. f. 68.—N. dep. *Mont.* Test. Brit. 190; Suppt. 78. t. xviii. f. 9.—English and Scottish shores.

Chambers about nine in number; the partitions slightly curved, ending at the centre in a pellucid spot.

9. N. *umbilicatulus.*—Depressed, exteriorly rounded; partitions sunk, with a subtuberculated elevation in the middle.

N. spiralis umbilicatus geniculis sulcatis, *Walker*, Test. Min. 19. t. iii. f. 69.—N. umb. *Mont.* Test. Brit. 191; Suppt. 78. t. xviii. f. 1.—English and Scottish shores.

Chambers ten, rounded on the sides, but nearly even on the margin, with a frosted appearance on the surface. Partitions flexuous, ending at the centre in a pellucid spot. The geographical range of this species is extensive. It occurs on the coasts of Devon and of Zetland, and I have even detected it on corallines found on the surface of the sea, about the middle of Hudson's Straits, in 1821, by Captain Parry.

10. N. *crassulus.*—Depressed, umbilicated, and shewing part of the interior volution.

N. spiralis, crassus, utrinque umbilicatus, geniculis lineatis, *Walker*, Test. Min. t. iii. f. 70.—N. crassulus, *Mont.* Test. Brit. Suppt. 79. t. xviii. f. 2.—English coast, rare.

Shell opake brown, with numerous close-set elevated joints. Sides similar. Mouth placed a little oblique, scarcely clasping the body, and furnished with a syphon.—The internal structure of these recent species can scarcely be satisfactorily determined.

◆

EXTINCT SPECIES.

1. N. *imperialis.*—"Involute, umbilicate. Aperture lunate. Septa entire, concave, broadest in the middle, truncated, and slightly recurved at their ends. Siphunculus nearest to the inside."—*Sowerby's* Mineral Conchology, t. i.—In the London clay, Highgate.

2. N. *centralis.*—"Involute umbilicate. Aperture bluntly lunate. Septa entire, concave, not recurved at their ends. Siphunculus central."—*Sowerby's* Min. Conch. t. i. left hand figure.—*London clay.*

3. N. *inæqualis.*—"Spheroidal umbilicate, aperture nearly round; septa distant in the inner whorls, and approaching near together in the outer whorls; siphunculus near the inner margin of the septum."—*Sower.* Min. Conch. t. xl. lower figures.—In *Chalk Marl*, Folkstone.

4. N. *undulatus.*—"Gibbose; surface largely undulated, sides rather conical, edge flat; aperture obcordate, inner whorls concealed." Siphunculus near the centre.—*Sower.* Min. Conch. t. xl. In *Green Sand*, Nutfield, Surrey.

5. N. *lineatus.*—"Flatted spheroidal, umbilicate, surface obscurely striated, back flat, broad, with a concave line in the interior (which appears convex around the cast). Aperture rather square, deeply indented by the preceding whorl, septa numerous, concave, siphunculus central."—*Sower.* Min. Conch. t. xli.—*Inferior Oolite*, Comb-down, Bath.

6. N. *elegans.*—"Gibbose, umbilicate, with numerous linear, reflexed, radiating sulci."—Siphunculus central.—*Sower.* Min. Conch. t. cxvi. *Mantell's* Fossils of the South Downs, p. 112, t. xx. f. 1.—In *Chalk Marl*, Sussex.

7. N. *Comptoni.*—"Lenticular, carinated; centre covered; surface smooth; keel obtuse; aperture acutely triangular." Less than a line.—*Sower.* Min. Conch. t. cxxi.—In *Chalk Marl*, Wilts.

8. N. *simplex.*—"Depressed, spheroidal, umbilicate, plain; mouth lunate, with the angles truncate, embracing the preceding whorl; siphuncle nearest to the inner edge of the septum."—*Sower.* Min. Conch. t. cxxii. In *Green Sand.*

9. N. *truncatus.*—"Thick, flatted, plain, umbilicate; back flat, mouth elongated, four-angled; siphuncle (oval) nearest to the inner margin of the septum."—*Sower.* Min. Conch. t. cxxiii.—In *Lias* Limestone, Bristol.

10. N. *obesus.*—" Gibbose, umbilicate, plain; back broad, flat; mouth large, squarish; septa very numerous, not recurved; siphuncle nearly central."—*List.* Conch. 1048. ? *Sower.* Min. Conch. t. cxxiv. (transversely oval.—*Inferior Oolite*, Norton-under-Ham.

11. N. *bilobatus.*—" Subglobose, umbilicated; septa two-lobed; aperture three or four times as wide as long." Margin a little flattened; umbilicus small, nearly cylindrical; syphon central.—*Sower.* Min. Conch. t. ccxlix. f. 2, 3.—In the Limestone of the *Old Red Sandstone*, Closeburn, Dumfriesshire.

12. N. *regalis.*—" Gibbose, plain, not umbilicate; front flattish; sides convex; aperture rather wider than long."—*Sower.* Min. Conch. t. ccclv.—In *London Clay.*

13. N. *radiatus.*—" Gibbose, umbilicated; surface marked with curved radiating undulations; sides and front rounded; aperture orbicular, deeply indented."—*Sower.* Min. Conch. t. ccclvi.—In *Green Sand*, Maltor.

14. N. *Wrightii.*—" Gibbose, smooth, rounded exteriorly, partitions distant, slightly waved; syphon nearer the exterior than the centre of the chamber: shell increasing rather suddenly."—*Flem.* Wern. Mem. iii. 96. I owe the specimen of this species which I possess to Samuel Wright, Esq., who found it in the *Transition Limestone*, Cork. It bears a near resemblance in form to *N. elegans.*

* * *

In the twelve following species, the inner whorls are more or less conspicuous, in consequence of the body-whorl not clasping the inner whorls so completely as in the preceding species.

15. N. *discus.*—" Depressed, edge flat, aperture oblong, volutions not concealed by each other." Outer edge of the aperture narrower than the inner one, and notched by a marginal groove; syphon near the inner edge.—Sower. Min. Conch. t. xiii.—In *Carboniferous Limestone*, Kendal.

16. N. *intermedius.*—" Gibbose, umbilicate, concentrically striated; back broad, flattened, mouth squarish: siphuncle nearest the external edge."—*Sower.* Min. Conch. t. cxxv.—In limestone in the *Lias* at Keynsham.

17. N. *striatus.*—" Slightly depressed; umbilicate; concentrically striated; aperture half the diameter of the shell, nearly orbicular."—The whorls increase rapidly; the front a little compressed; the striæ elevated.—*Sower.* Min. Conch. t. clxxxii.—In *Lias*, Lyme Regis.

18. N. *pentagonus.*—" Discoid, subcarinated; inner turns partly concealed; aperture orbicular, obscurely 5-angled, and impressed by the preceding whorl, nearly half the diameter of the shell." Sides a little flattened; septa not very concave, with a central siphuncle."—*Sower.* Min. Conch. t. ccxlix. f. 1.—In limestone of the *Old Red Sandstone*, Closeburn.

19. N. *tuberculatus.*—" Discoid, thick, largely umbilicate; one row of large tubercles on each side; front rounded; aperture transversely elongated, 2-angled."—*Sower.* Min. Conch. t. ccxlix. f. 4.—In the limestone of the *Old Red Sandstone*, Closeburn.

20. N. *Luidii.*—Whorls apparent, rounded with longitudinal serrated striæ; septa concave, with the syphon placed near the exterior margin.—Martin, Petrificata Derbiensia, t. xxxv. f. 12.—In clay in the *Coal formation*, Derbyshire.

21. N. *ingens.*—Volutions three, nearly external, even, round, gradually tapering; septa oblique, slightly waved.—Mart. Pet. Derb. t. xli. f. 5.—In *Carboniferous Limestone*, Derbyshire. This is probably the species which Ure refers to in his Natural History of Rutherglen and Kilbride, p. 307. " The

spires of the one are smooth and round, without any depression or *sulci:* the specimen is about 6 inches broad."

22. N. *excavatus.*—A deep central cavity; the whorls smooth, wide, carinated, conical on the sides, and flattened or slightly emarginated exteriorly: chambers numerous, the syphon nearly central. The specimens which I possess are about 3 inches in diameter, and 2 inches wide, and were given me by Samuel Wright, Esq., from the *Carboniferous Limestone*, Limerick.

23. N. *marginatus.*—Exteriorly carinated, sides arched; septa waved; syphon nearest the outer margin. In young shells the whorls are more rounded, the ridges on the back and sides being obsolete. This is probably the shell to which Mr Sowerby referred, at his *N. pentagonus*; " the first specimen I received of this Nautilus was found in black limestone, at Bathgate, Scotland. and given to me by my friend, Dawson Turner, Esq." My own specimens collected in the same neighbourhood, appear to belong to a species different from *N. pentagonus.* In *Carboniferous Limestone.*

24. N. *funatus.*—Elliptical, discoid, volutions apparent, " with numerous transverse simple rounded risings, relieved by rather wider grooves, at intervals, a kind of constriction distinguished by a small protuberance on the inner part of the rising immediately beyond it."—*Sower.* Min. Conch. t. xxxii., where it is considered as the type of the genus Ellipsolithes. Its structure is unknown.—In *Transition Limestone*, Cork.

25. N. *compressus.*—" Elliptical, flat, smooth; margin broad, flat, perpendicular to the sides; volutions four or five, almost wholly exposed; aperture oblong, rectangular."—*Ellipsolithes compressus*, *Sower.* Min. Conch. t. xxxviii. Structure unknown, probably nearly similar to the following species, which, in the quadrangular form of its whorls it so closely resembles, as it likewise does the *N. complanatus.*—In *Transition Limestone*, Cork.

26. N. *quadratus.*—Discoid, whorls quadrangular, sides flat, smooth; outer edge flat, with numerous transverse concave striæ, and fine longitudinal ridges, four or five in number near the margin: chambers shallow, the syphon near the outer edge. In the cast, the outer margin is flat in the middle, sloping off angularly to the edge; the sides with three longitudinal grooves. In *Carboniferous Limestone*, West Lothian.

In the four following species, the partitions have a remarkable concave bend on the side, making an approach to the genus *Ammonita.*

27. N. *ziczac.*—" Involute, inner turns concealed, aperture bluntly triangular, septa concave, much recurved at their ends with a deep indenture in the edge on each side, siphunculus nearest to the inside.—*Sower.* Min. Conch. t. i. lowest figure.—In the *London Clay*, Highgate.

28. N. *sinuatus.*—" Thick, umbilicate, concentrically striated; side depressed, conical; front convex; aperture obtusely sagittate, truncated; the septa have a large sinus on each side."—*Sower.* Min. Conch. t. cxciv.—In the *Inferior Oolite* near Yeovil.

29. N. *complanatus.*—" Discoid, compressed, smooth; sides flat; inner turns exposed; aperture lanceolate. A reversed sinus in the edge of each septum, near the inner angle."—*Sower.* Min. Conch. cclxi.—In *Transition Limestone?* at Scarlet, Isle of Man.

30. N. *ovatus.*—Oval, gibbose, umbilicated, edges rounded, inner volutions nearly concealed by the outer; surface smooth; aperture obtusely sagittate. —*Ellipsolites ovatus*, Sower. Min. Conch. t. xxxvii. In some specimens in my possession, which I owe to the kindness of Samuel Wright, Esq., the septa have a deep lateral wave like the three preceding species; the chambers are numerous, and there appear to be constrictions at intervals on the larger whorl.—In *Transition Limestone*, Cork.

GEN. IV. ROTALIA.—The lower disc occupied by the last formed whorl, the partitions of which radiate from the centre to the margin; the whorls on the upper disc exposed.

11. R. *Beccaria.*—Chambers nearly flat, numerous, the whorls dextral.

N. spiralis, umbilicatus, geniculis insculptis, *Walk.* Test. Min. t. iii. f. 63. —N. Bec. *Mont.* Test. Brit. 186. t. xviii. f. 4.—On fuci and corallines.

Volutions four or five, forming, above, a slightly convex disc; the partitions sunk, and convex on the sides; aperture ovate, transverse near the inner margin: the rays of the partitions of the lower disc obscure towards the centre.

12. R. *Beccarii*-perversus.—Chambers nearly flat, numerous, the whorls sinistral.

N. B–p. *Walk.* Test. Min. t. iii. f. 6. *Mont.* Test. Brit. 187. t. xviii. f. 6.

This shell is found along with the last, and is said by Montagu to be equally plentiful. On the Scottish coast it is greatly more abundant, and grows to a superior size.

13. R. *inflata.*—Chambers tumid, few.

Naut. inflatus, *Mont.* Test. Brit. Supp. 81. t. xviii. f. 3.—Among sand, Devonshire.

Volutions three, the last having five ventricose articulations. The upper disc is more tumid, and the chambers less crowded than in either of the preceding species. In a single specimen found on corallines, Zetland, which I possess, the whorls are sinistral, though in other respects it agrees with the description of Montagu.

GEN. V. LOBATULA.—The upper disc occupied by the last formed whorl, the partitions of which radiate from the centre to the margin; the whorls on the lower disc exposed.

14. L. *vulgaris.*—Surface of the chambers frosted; five or six on the upper disc.

N. spiralis, lobatus, anfractibus supra rotundatis subtus depressioribus, *Walk.* Test. Min. t. iii. f. 71.—Serpula lobata, *Mont.* Test. Brit. 515. —On shells and corallines, common.

Upper disc convex, the partitions and centre slightly depressed, the chambers a little rounded. Lower disc uneven, conforming to the body on which it rests or adheres; of three whorls; aperture at the inner margin, transverse, and nearest the lower disc. A variety, with the whorls sinistral, occurs in nearly equal abundance. Both are subject to great variations of growth.

15. L. *concamerata.*—Surface of the chambers glossy and smooth.

Serpula con. *Mont.* Test. Brit. Supp. 160.

This species, found by Montagu on the coast of Devon, is thus described: "Shell suborbicular, compressed, flat beneath, slightly convex above, and of a subpellucid white colour, with three irregular volutions, and numerous dissimilar concamerations; the exterior whorl has about nine glossy and tumid cells, of unequal size, but usually a larger and smaller alternate. Diameter half a line. This very minute species is at once distinguished from *S. lobata*, by possessing much more numerous and infinitely more minute chambers, which are smooth and glossy, and not of that frosted appearance the *lobata* is invariably found to be, when examined by a microscope." The author whom we have quoted, was inclined to consider the adhesion of these species to corallines and other bodies as identifying them with the genus *Spirorbis.* They are not (at least the *Lobatula vulgaris*), however, cemented, but seem to adhere by the intervention of some animal matter.

GEN. NUMMULITA. — Lenticular, with an internal discoidal multilocular spire, divided into numerous chambers by transverse imperforated septa, and covered by several plates, the wall of each turn being complicated, extended and united on each side to the other discs.

1. N. *lævigata.*—Convex on both sides, and smooth.

Lamark, Syst. Vert. vii. 629. *Park.* Org. Rem. iii. 152. t. x. f. 13.—In the London Clay, Hubbington Cliff.

GEN. VI. VERMICULUM.—Chambers gibbose, the mouth alternately at the opposite ends of the axis.

16. V. *intortum.*—Mouth compressed, with a simple tooth attached to the proximal side.

Serpula seminulum, *Linn.* Syst. i. 1264.—Serp. subovalis umbilico pervio, *Walk.* Test. Min. t. i. f. 1.—Serp. ovalis, *Adams*, Linn. Trans. v. p. 4. t. i. f. 28, 29, 30.—Ver. in. *Mont.* Test. Brit. 520.—*Flem.* Wern. Mem. iv. 564. t. xv. f. 3.—Common on corallines and old shells.

Size about $\frac{1}{10}$th of an inch, a little compressed, the external margin subacute. Three chambers are usually visible on one side, and four on the other, slightly striated across with the line of separation distinct. The tooth is a triangular thin plate, a little recurved at the tip, and so persistent as frequently to remain after the outer side of the chamber has been destroyed.

17. V. *oblongum.*—Mouth round, with a pedunculated forked tooth.

Mont. Test. Brit. 522. t. xiv. f. 9. *Flem.* Wern. Mem. iv. 565. t. xv. f. 4. —Common.

Rather less than the preceding. Three chambers are usually visible on one side, and two on the other; in the former the middle chamber is partially embraced by the outer ones, so that a shallow depression is formed at the outside of the line of junction. On the other side of the shell a similar depression is observable, and produced by the margin of the last chamber rising on the side of the second. The chambers are rounded externally.

18. V. *subrotundum.*—Mouth depressed, toothless.

Serpula subrotunda dorso elevato, *Walk.* Test. Min. t. i. f. 4.—Ver. sub. *Mont.* Test. Brit. 521. *Flem.* Wern. Mem. iv. 565. t. xv. f. 5.—Common.

Globular, chambers three, rarely four, inflated and wrinkled. The fourth chamber, when present, seems always imperfectly formed.

19. V. *bicorne.*—The last formed chamber striated longitudinally.

Serpula bicornis ventricosa, *Walk.* Test. Min. t. i. f. 2.—Ver. bicorne, *Mont.* Test. Brit. 519.—Sandwich and Reculver, *Mr Boyes.*

Length one line; chambers three, the middle one small, raised or depressed; the last chamber is suboval, compressed, striated longitudinally on the longer side from the aperture; the other side is smooth: It contracts towards the mouth, which is very small and orbicular.

These species belong to the genus *Milista* of Lamark, instituted many years subsequent to the *Vermiculum* of Montagu. The fossil species of France are numerous.

GEN. VII. ARETHUSA? (*of Montfort*). — Cells arranged obliquely and alternately along an axis, with the mouths of all the chambers having an aspect towards the same pole; forming a subturriculated shell.

20. A. *lactea.*—Chambers ovate, aperture circular.

Serpula tenuis ovalis lævis, *Walk.* Test. Min. t. i. f. 5.—Vermiculum lacteum, *Mont.* Test. Brit. 522. *Flem.* Wern. Mem. iv. 566. t. xv. f. 6.—Among corallines, English and Scotch coasts.

Length about $\frac{1}{20}$th of an inch, delicately transparent, with the inner walls of the chambers appearing as white veins. The chambers are six or seven in number, well defined on one side, obscure on the other, contracted towards the mouth. Walker and Montagu obtained this species at Sandwich and Devon, Captain Laskey at Dunbar, and I have it from Leith and Zetland.

GEN. VIII. LAGENULA.—Shell with a globular body, having a produced neck or tube.

* *With longitudinal markings.*

21. L. *striata.*—Shell pellucid, with opake, fine, longitudinal striæ.

Serpula (Lagena) striata sulcata rotundata, *Walk.* Test. Min. t. 1. f. 6. —Vermiculum striatum, *Mont.* Test. Brit. 523.—Not uncommon in sand on the English shores.

In shape, this species resembles a Florence flask; rounded retrally; the mouth is slender and produced, with a small round aperture; length not half a line.

22. L. *perlucida.*—Shell with six equidistant, longitudinal ribs.

Ver. per. *Mont.* Test. Brit. 525, t. xiv. f. 3.—At Seasalter, Mr Boys.

Length about $\frac{1}{10}$th of an inch; smooth; rounded retrally with a small knob; aperture very small.

** *With decussating striæ.*

23. L. *squamosa.*—Striæ undulated, giving the shell an imbricated appearance.

Verm. squam. *Mont.* Test. Brit. 526, t. xiv. f. 4.—At Seasalter, Mr Boys.

Shell minute, subglobose, the aperture a little produced.

*** *Surface smooth.*

24. L. *globosa.*—Nearly ovate, the mouth not produced.

Serp. Lag. lævis globosa, *Walk.* Test. Min. t. 1. f. 8.—Sandwich, rare.

Shell white, transparent; the aperture round.

25. L. *lævis.*—Ovate, with a produced cylindrical neck.

Serp. Lag. lævis ovalis, *Walk.* Test. t. 1. f. 9.—At Sandwich, rare.

Bluish-white, transparent; it differs from the last in its more oblong shape and produced mouth.

26. L. *marginata.*—Compressed, marginated.

Serp. Lag. marginata, *Walk.* Test. Min. t. 1. f. 7.—Verm. marg. *Mont.* Test. Brit. 524.—On the English coasts, rare.

Shell nearly ovate; the mouth but little produced. In a single specimen, which I found in sand, from Zetland, and which, by accident, was broken on the stage of the microscope, appearances of internal plates, the partitions of chambers, were indistinctly observed.

27. L. *urna.* Globular, with a produced knob retrally.

Verm. urnæ, *Mont.* Test. Brit. 525, t. xiv. f. 1.—In sand from Shepey Island.

Length about a line; slopes suddenly into a short conic neck.

The place of this genus is far from being satisfactorily determined, and the minuteness of the species composing it present great obstacles to an accurate examination.

GEN. IX. ORTHOCERA.—Shell (naked?) nearly straight, the chambers separated by transverse perforated septa.

a. *Recent species.*

* *With longitudinal ribs.*

28. O. *jugosa.*—Subcylindrical, slightly curved, with numerous longitudinal ribs.

Nautilus jug. *Mont.* Test. Brit. 198, t. xiv. f. 4.—On the Kentish coast, Mr Boys.

Length about $\frac{1}{8}$th of an inch; tapering little, chambers globose, nine in number, the first the longest, the last produced into a conical neck, with a round aperture. The colour brown.

29. O. *costata*.—Subcylindric, straight, with four longitudinal ridges.

N. cos. *Mont.* Test. Brit. 199, t. xiv. f. 5.—On the Kentish coast, Mr Boys.

Length $\frac{1}{4}$th of an inch; tapering little; chambers subglobose, twelve in number; the ribs strong; the neck of the last chamber shorter than in the preceding species. A variety is recorded by *Mont.* ib. Supp. 84, t. xix. f. 2, as having only five joints and seven ribs, anteally truncate; retrally terminating in a solid produced process. A second variety is likewise noticed at the same page, in which the joints are five in number.

30. O. *bicarinata*.—Subcylindric, arcuated, the joints bicarinated.

N. bicar. *Mont.* Test. Brit. Supp. p. 86.—Sandwich, Mr Boys.

Length $\frac{1}{8}$th of an inch; joints eleven, globose, the ribs on the convex and concave sides; anteally the mouth is produced; retrally there is a rounded point.

31. O. *linearis*.—Straight, compressed, the retral half with faint oblique ribs.

N. lin. *Mont.* Test. Brit. Supp. 87, t. xxx. f. 9.—Dunbar, Capt. Laskey.

Length $\frac{1}{4}$th of an inch, nearly linear; the chambers are about fourteen in number, the septa oblique; the anterior end smooth, terminating in a produced mouth, the other rounded.

** *With spines or tubercles.*

32. O. *spinulosa*.—Spines numerous, reflected.

N. spin. *Mont.* Test. Brit. Supp. 86, t. xix. f. 5.—Sandwich, Mr Boys.

Joints three, globose, the last produced to form the mouth. Montagu notices a variety with eight subglobose joints which are tuberculated, which he found in the Boysian cabinet. Its length $\frac{1}{10}$th of an inch.

*** *Chambers smooth.*

33. O. *recta*.—Shell nearly straight, joints transverse, chambers subcylindric.

N. rectus, *Mont.* Test. Brit. 197, t. xix. f. 4. 7.—Sandwich, Mr Boys.

Form a little tapering, length about $\frac{1}{10}$th of an inch, with eight or nine chambers.

34. O. *radicula*.—Shell straight, joints transverse, chambers subglobose.

N. rad. *Mont.* Test. Brit. 197, t. vi. f. 4, and t. xiv. f. 6.—Sandwich.

" This species appears to be subject to very considerable variation with respect to the extreme joint at each end, as well as in the number. In some the aperture is extended to a conic point; in others it is only a small round opening on the extreme articulation, which is globose; the smaller end, in some, is rounded; in others conic, pointed."

35. O. *subarcuata*.—Shell subcylindric, subarcuated, with

three conspicuous globose articulations at the larger end, the remaining joints being scarcely visible.

N. sub. *Mont.* Test. Brit. 198, t. vi. f. 5.—From Sandwich, Mr Boys.

Length $\frac{1}{10}$th of an inch; aperture a small produced syphon. A variety was found by Mr Boys "having ten distinct articulations; the extreme one at the smaller end longer than any of the others, except the anterior one, in which the aperture is placed."

36. O. *legumen.*—Compressed with oblique septa.

N. rectus, geniculis depressis, *Walk.* Test. Min. t. iii. f. 74. N. Fig.—*Mont.* Test. Brit. Supp. 82. t. xix. f. 6.—Coast of Kent and Devon.

Subarcuated, $\frac{1}{8}$th of an inch, nearly of equal size, ends rounded. The anterior end surrounded by an oblique ridge, above which rises an obtuse syphon, with a considerable aperture near the concave side.

How far these species possess claims to continue in the genus *Orthocera*, I have not been able to determine, as, in the course of numerous microscopical examinations of shell-sand from different parts of the Scottish coast, I have not as yet detected a single individual of any of the species here noticed. The existence of a continuous syphon would alone entitle them to remain in this genus, otherwise they would belong to the genus *Nodosaria* of Lamark, in which genus the three following species might be included, though their history is at present involved in considerable obscurity. Their multilocular character was first pointed out to me (in the case of the *imperforata*) by Mr Miller, the learned author of the Treatise on Crinoid Animals. At present, however, I shall retain them in the genus *Orthocera*, and give their characters from a single chamber, as the shells, entire, have not as yet been met with.

37. O. *imperforata.*—Chamber cylindric, subarcuated, and slightly striated transversely.

Dentale apice imperforata transversaliter substriata, *Walk.* Test. Min. t. i. f. 15.—Dentalium imp. *Mont.* Brit. 496.—On the English coasts.

Length of the chamber $\frac{1}{8}$th of an inch; aperture round, a little contracted at the margin, the opposite end closed, truncated and furnished with a small protuberance.

38. O. *Trachea.*—Chamber subcylindric, and regularly annulated.

Dent. Trachea, *Mont.* Test. Brit. p. 497, t. xiv. f. 10.—On the English and Scottish coasts.

Length about $\frac{1}{8}$th of an inch, and the diameter about $\frac{1}{3}$d of its length. Colour white. Rings regular, close set, sharp in a young specimen, but rounded in a larger one in which those near the mouth are largest, and the whole are crossed by obsolete longitudinal ridges. It tapers little. The extremity is truncated with a raised acute margin, with a lateral tubercle on the disc, the place of the syphon.

39. O. *glabra.*—Chamber cylindrical, smooth, and glossy.

Dent. glabrum, *Mont.* Test. Brit. 497.—Cæcum glabrum, *Flem.* Edin. Encyc. vii. 67, t. cciv. f. 7.—English and Scottish coasts.

The length of the chamber is about a line, and its diameter about $\frac{1}{5}$th of its length. It is cylindrical, smooth, glossy, and transparent, the extremity hemispherical and submarginated. A variety of this shell, from Zetland, tapers a little to the extremity, which is more obliquely placed than in the others, and produced into a blunt knob at the upper margin. The aperture is likewise a little contracted.

b. *Extinct species.*

* *Surface of the shell smooth.*

1. O. *lævis.*—Shell conical, partitions waved; chambers large; syphon small and central. The length of the specimen which I possess is upwards of 3 inches. The breadth at the base is $\frac{9}{10}$ths, and at the apex $\frac{2}{10}$ths. The shell is very thin; chambers about $\frac{2}{10}$ths of an inch in depth; partitions waved on both sides; syphon in the middle of the shell about $\frac{1}{40}$th of an inch wide.—O. superficie lævi, *Ure's* Rutherglen, 306, t. xvi. f. 3.—O. lævis, *Flem.* Annals of Phil. v. 201, t. xxxi. f. 1.—In *Carboniferous Limestone.*

2. O. *pyramidalis.*—Shell tapering, partitions slightly waved; chambers large, syphon small and central. This is longer in proportion to its breadth than the preceding; the length of one specimen is upwards of 6 inches; 1 inch and $\frac{2}{10}$ths at the larger end, and $\frac{2}{10}$ths at the apex; the last formed chambers are nearly $\frac{3}{10}$ths of an inch in depth, while the oldest, towards the point, are scarcely $\frac{1}{10}$th. A fragment found contiguous measured 2 inches in diameter. —*Flem.* An. Phil. v. p. 202, t. xxxi. f. 2.—In *Carboniferous Limestone.*

3. O. *cylindracea.*—Nearly cylindrical, partitions slightly waved, chambers numerous, pipe minute and central. In a specimen $3\frac{1}{4}$th inches in length, $\frac{4}{10}$ths at the base, and $\frac{3}{10}$th of an inch at the apex, the chambers are scarcely $\frac{1}{10}$th in depth. When the shell is removed, the chambers appear very distinct, with a flat surface.—*Flem.* An. Phil. v. p. 202, t. xxxi. f. 3.—In *Carboniferous Limestone* and *Slate-clay* of the coal-field.

4. O. *convexa.*—Nearly cylindrical, partitions thin and concave; syphon large and lateral. In a specimen $4\frac{1}{2}$ inches long, the diameter at the base was $1\frac{1}{4}$th, and at the apex $\frac{8}{10}$ths. The lower chambers are about $\frac{1}{8}$th of an inch in depth. The syphon is about $\frac{3}{10}$ths of an inch wide, and placed about midway between the centre and margin.—*Flem.* An. Phil. v. p. 202. t. xxxi. f. 4. O. circularis, *Sower.* Min. Conch. t. 60. f. 6. 7. ?—In *Carboniferous Limestone.*

5. O. *attenuata.*—Tapering, partitions nearly circular; chambers large. The shell of this species in one specimen is very thin, transparent, and glossy, and in some places is minutely striated across. Another specimen $\frac{6}{10}$ths long, $\frac{1}{8}$th at the base, and $\frac{1}{20}$th at the apex, contains fifteen chambers.—In *Slate-clay* of the coal-field.

6. O. *Breynii.*—Conical, partitions waved on the syphon side; the syphon itself is lateral, small, and cylindrical.—*Martin*, Pet. Derb. t. 39, f. 4. *Sower.* Min. Conch. t. 60. f. 5.—*Carboniferous Limestone.*

7. O. *undulata.*—Shell oval, thin, smooth; partitions numerous, oblique, their edges rising, oval, with a wave on each side; syphon lateral.—In *Carboniferous Limestone.*

8. O. *conica.*—Shell long, conical, aperture oval; chambers numerous; syphon small, oval, nearly touching the margin.—*Sower.* Min. Conch. t. lx. f. 1, 2, 3.—In *Lias.* In the Geology of England and Wales, p. 268, this is considered as the alveolus of a Belemnite.

9. O. *cordiformis.*—" Obconical; base contracted; sides convex; aperture round;" septa numerous, placed directly across; syphon not quite in the centre, the tube of which is inflated into a globular form between each septum.—*Sower.* Min. Conch. t. ccxlvii.—In Limestone of the *Old Red Sandstone*, Closeburn, Dumfriesshire.

** *Striated transversely.*

10. O. *striata.*—Nearly cylindrical, septa numerous, deep; syphon nearly central; surface regularly striated transversely.—*Sower.* Min. Conch. t. lviii. *Flem.* Wern. Mem. iii. 96.—*Transition Limestone*, Cork. In the clay-slate of the same formation, at the Cove of Cork, another species occurs, the characters of which are not established.

11. O. *Steinhaueri.*—Tapering; chambers deep, partitions distant, even edged, circular; syphon close to one side; striæ of the surface regular and even.—*Sower.* Min. Conch. lx. f. 4.—In *Carboniferous Limestone.*

12. O. *gigantea.*—Shell gradually tapering, finely striated, aperture upwards of 8 inches in diameter; septa direct, numerous, deep; syphon a small distance from the centre.—*Sower.* Min. Conch. t. ccxlvi.—In limestone of the *Old Red Sandstone*, Dumfriesshire.

*** *Surface with transverse ridges.*

13. O. *sulcata.*—Shell tapering; ridges waved and striated; syphon small, central. The length of one specimen is 2 inches and $\frac{6}{10}$ths, diameter at the base $\frac{7}{10}$ths, and at the apex $\frac{2}{10}$ths. It contains thirty-one ridges, which are twice waved in going round the shell: both the ridges and intervening grooves are finely striated.—*Ure's* Ruth. 306, t. xvi. f. 2. *Flem.* An. Phil. v. 202, t. xxxi. 6.—In slate-clay of the *Coal Formation.*

14. O. *undata.*—Shell tapering, ridges waved and smooth; pipe small, central. In a specimen 1 inch and $\frac{2}{10}$ths in length, it is $\frac{7}{10}$ths in diameter at the base, and upwards of $\frac{5}{10}$ths at the apex; with eleven ridges, more deeply waved, and less numerous than the preceding. There is the appearance of an epidermis of a black colour, and obscurely striated; where the shell is exposed, both the ridges and the grooves are perfectly smooth. An imperfect specimen of an Eschara adheres to the shell.—*Flem.* An. Phil. v. 203.—In slate-clay of the *Coal Formation.*

15. O. *annularis.*—Subcylindrical; ridges distant, nearly even and smooth. The largest portion of the shell which I possess is about 1 inch in length, and upwards of $\frac{3}{10}$ths in diameter; ridges nearly $\frac{1}{8}$th distant; more obtuse than the preceding, with at least two chambers in the interval.—*Flem.* Ann. Phil. v. 203.—In *Carboniferous Limestone.*

16. O. *annulata.*—Tapering, subcompressed, with strong, waved, slightly oblique ridges, and intervening striæ: syphon sublateral; a space near the aperture without ridges.—*Sower.* Min. Con. t. cxxxiii.—*Carboniferous Limestone*, Colebrookedale.

17. O. *rugosa.*—Subcylindrical; ridges waved, and tuberculated with longitudinal lines; syphon minute, and placed close to the edge. The length of a specimen which I possess is $1\frac{1}{4}$ inch; the diameter $\frac{6}{10}$ths; the ridges are $\frac{2}{10}$ths asunder, and contain two chambers in the interval.—*Flem.* Ann. Phil. v. 203. —In *Carboniferous Limestone.*

**** *With longitudinal planes or furrows.*

18. O. *Gesneri.*—Conical, with numerous longitudinal furrows, regularly concave and close.—*Mart.* Pet. Derb. t. 38. f. 1, 2.—In *Carboniferous Limestone*, Derbyshire.

17. O. *angularis.*—Nearly cylindrical, angular, with about 16 smooth longitudinal planes; syphon small and lateral. I possess about half an inch of this shell, which is nearly of equal thickness, scarcely exceeding the tenth of an inch in diameter.—*Flem.* Ann. Phil. v. 203. t. xv. f. 10.—In *Carboniferous Limestone.*

GEN. BELEMNITA.—Apex solid, having a conical cavity towards the base occupied by a shell divided transversely into chambers, with a syphon.

1. B. *fusiformis.*—A receptacle for the alveolus exists towards the base in the form of a cone, from the point of which the body of the fossil again swells, and continues of a compressed roundish shape, with a longitudinal sulcus for an inch or two, when it terminates with a tapering point.—*Parkinson's* Organic Remains, iii. 127. t. viii. f. 13.—In *Lower Oolite*, Stonesfield, Oxford.

2. B. *Listeri.*—Subfusiform, cylindrical, with one longitudinal sulcus, apex pointed. Siphunculus central, extending through the alveolus to the apex of the spathose part.—B. min. *List.* An. Ang. 227, f. 32. B. List. *Mant.* Fossils, 83, t. xix. f. 17, 18. 23.—In *Chalk-Marl.*

3. B. *coniformis.*—Conical or produced, pointed, with one or more longitudinal grooves.—*Park.* Or. Rem. iii. 127. t. viii. f. 15.—In *Lias.*

4. B. *Allani.*—Nearly cylindrical, the apex conical, with a slender produced point. Alveolus conical, pointed, the point sublateral.—Belemnite, *Allan*, Edin. Trans. ix. p. 407. t. xxv. *Mant.* Fossils, 201, t. xvi. f. 1.—In *Chalk.*

Many species, not yet determined, occur in the chalk lias, and intermediate beds.

GEN. CONULARIA.—Conical, hollow, divided into chambers by partitions destitute of a syphon; mouth half closed.

1. C. *quadrisulcata.*—Four-sided, straight, transversely sulcated, and longitudinally striated; the four angles sulcated. In the centre of each side, the sulci are bent, the spaces between these form very narrow ridges, and the longitudinal striæ are most conspicuous within the hollows. Two of the opposite are longer than the others. A curious fossil.—*Ure's* Ruth. 330. t. xx. f. 7. —Con. quad. *Sower.* Min. Con. t. ccxl. f. 3, 4, 5, 6.—*Carboniferous Limestone.*

2. C. *teres.*—Conical, round, slightly bent, transversely striated, a smooth space near the apex; striæ irregular, as well as the curvature; the general form approaches towards cylindrical, but the smooth part near the apex is more conical.—*Sower.* Min. Conch. t. cclx. f. 12.—In *Carboniferous limestone.*

GEN. AMMONITA.—Sides equal, whorls contiguous and apparent.

* *Surface of the whorls smooth.*

1. A. *Henslowi.*—Discoid, sides flat, front rounded; whorls 4, exposed; partitions with three entire tongue-shaped lobes on each side; aperture obovate. —*Sower.* Min. Conch. t. cclxii.—In *Transition Limeston?* Scarlet, Isle of Man.

** *Surface striated or ribbed.*

2. A. *acuta.*—Depressed, whorls 3 or 4, the inner ones half exposed; surface with straight projecting radii on the inner half of each whorl; the margin slightly carinated, and crenated; aperture triangularly cordate.—*Sower.* Min. Conch. t. xvii. f. 1.—In the *London Clay* at Munster Cliff.

3. A. *cordata.*—Depressed, whorls 4 or 5, the inner ones half exposed; surface with angular, projecting, undulating radii, extending over the inner half of each whorl, the remaining half covered by diverging undulations, end-

ing in a carinated margin; aperture cordate.—In limestone of the *Upper Oolite*, at Shotover, Oxfordshire.

4. A. *quadrata.*—Depressed, whorls 4 or 5, the inner ones half concealed; surface with projecting, furcate, undulating radii, extending into a crenated margin; aperture obtusely square.—*Sower.* Min. Conch. t. xvii. f. 3.—In a gravel-pit, Suffolk.

5. A. *serrata.*—Depressed, whorls 5, the inner ones two-thirds concealed; surface radiated and undulated near the circumference, keel distinct, nearly cylindrical, with a concavity in the shell on each side, sharply crenated, containing the siphunculus; apertures narrow, five-angled.—*Sower.* Min. Conch. xxiv.—At Worlinghame.

6. A. *Mantelli.*—Depressed, whorls 3 or 4, two-thirds concealed, edge three sided, broad and flattish; sides flattish, ridges alternately entire, and extending only about two-thirds across the whorl; the outer edges of the partitions have five principal folds; aperture obscurely six-sided.—*Sower.* Min. Conch. t. lv.—In *Chalk Marl*, Ringmer, Sussex.

7. A. *planicosta.*—Depressed, whorls 6, exposed, with transverse, obtuse ribs, flattened in front; mouth circular, slightly indented by the preceding whorl.—*Sower.* Min. Conch. t. lxxiii.—In *Chalk Marl*, and *Lias?*

8. A. *jugosa.*—Depressed, keeled, whorls 4, half concealed, with regular, straight, transverse, obtuse ribs; aperture ovate, narrowest at the front.—*Sower.* Min. Conch. f. xcii. f. 1.—In the *Inferior Oolite*, Ilminster.

9. A. *triplicata.*—Whorls 4, exposed, ribs twice curved, alternately one long and three short; a smooth line along the front; aperture obovate.—*Sower.* Min. Conch. t. xcii. f. 2.—*Upper Oolite*, Portland Isle.

10. A. *elliptica.*—Depressed, keeled, inner whorls two-thirds exposed; ridges broad, slightly curved, few, and obscure near the margin; aperture acutely elliptical; keel sharp.—*Sower.* Min. Conch. t. xcii. f. 4.—In *Lias*, Charmouth.

11. A. *stellaris.*—Depressed, with a groove on each side of an obtuse keel; whorls four, flattish on the sides, about two-thirds exposed; ribs numerous, straight, two of which cross each partition; syphon in the keel; aperture longer than wide. Surface with obscure, distant, decussating striæ.—*Sower.* Min. Conch. t. xciii.—In *Lias* at Lime.

12. A. *elegans.*—Depressed, acutely keeled, whorls 3, the inner ones two-thirds concealed; ribs numerous, equal, twice curved; keel distinct, entire, aperture acutely triangular, the inner angles truncate.—*Sower.* Min. Conch. t. xciv. upper figure.—*Inferior Oolite*, Ilminster.

13. A. *concava.*—Depressed, keeled, whorls 4, two-thirds concealed, a large central cavity, ribs numerous, curved, unequal in length, obsolete near the centre; keel sharp, entire; aperture acutely triangular, external angle rounded, internal angles obliquely truncate.—*Sower.* Min. Conch. t. xciv. lowest figure.—*Inferior Oolite*, Ilminster. A. t. clxvi. this species is said to occur likewise in the *Middle Oolite* at Dry Sandford, Berkshire.

14. A. *splendens.*—Depressed, front flat, with crenulated edges; whorls 3, quickly diminishing, three-fourths concealed; sides flat; ribs alternately long and short; aperture long, narrow in front.—*Sower.* Min. Conch. t. 103. —*Chalk Marl*, Folkestone.

15. A. *Callovicensis.*—Depressed, subumbilicate; whorls 5, three-fourths concealed; front flat, ribs small, numerous, alternately one long and from two to five short; aperture orbicular when young, deltoid, with the angles truncated when old.—*Sower.* Min. Conch. t. 104.—*Middle Oolite*, Kellaways Bridge.

16. A. *excavata.*—Lenticular, subumbilicate, keel sharp, crenulated; whorls 6, in full-grown shells three-fourths concealed; ribs curved, obscure; aperture sagittate, the inner angles truncated.—*Sower.* Min. Conch. t. 105.—In *Middle Oolite*, Shotover, Oxford.

17. A. *Walcottii.*—Depressed, whorls 4, three-fourths exposed, with a concentric smooth furrow along the inner margin; the keel with lateral furrows; sides flattish, with obscure lunate ribs; aperture oblong.—*Sower.* Min. Conch. t. 106.—In *Lias.*

18. A. *angulata.*—Whorls 6, exposed, with an inner marginal groove; ribs prominent, divided over the rounded front.—*Sower.* Min. Conch. t. 107. f. 1. —In *Lias*, Whitby.

19. A. *communis.*—Whorls 6, exposed, rounded, ribs prominent, divided and anastomosing on the outer margin; aperture circular.—*Sower.* Min. Conch. t. 107. f. 2, 3.—In *Lias*, Whitby.

20. A. *Nutfieldiensis.*—Whorls 4, half concealed, front rounded; ribs numerous, prominent, rounded, with short intermediate ones on the front; partitions numerous; aperture cordate.—*Sower.* Min. Conch. t. cviii.—In *Green Sand.*

21. A. *gigantea.*—Depressed, whorls 5, exposed ribs rounded, alternately entire and short, sometimes bifurcated; aperture ovate. Sometimes 2 feet and upwards in diameter.—*List.* Conch. t. 1046. *Sower.* Min. Conch. t. cxxvi. —*Upper Oolite*, Wilts.

22. A. *Bucklandi.*—Depressed, whorls 5, exposed, back flattish, with two concentric grooves, and an intermediate keel; ribs large, obtuse, swollen towards the back; aperture quadrate.—*Sower.* Min. Conch. t. cxxx.—In *Lias*, Bath.

23. A. *Conybeari.*—Depressed, whorls 8, exposed, keel large, with a shallow groove on each side; ribs large, rounded; aperture oblong.—*Sower.* Min. Conch. t. cxxxi.—In *Lias*, Bath.

24. A. *Greenoughi.*—Depressed, whorls 4, two-thirds concealed, obscurely undulated, back rounded; chambers numerous; aperture elliptical, deeply indented by the preceding whorl.—*Sower.* Min. Conch. t. cxxxii.—In *Lias*, Bath.

25. A. *fimbriata.*—Whorls cylindrical, exposed; lines of growth obtuse or acute, undulated or fimbriated; shell thin, margins of the septa with rounded lobes; mouth orbicular.—*Sower.* Min. Conch. t. clxiv.—In *Lias* at Lyme Regis.

26. A. *plicatilis.*—Whorls 6, exposed, sides flat, front round, plain in the centre; ribs numerous, equal, straight, furcate; septa acutely sinuated; aperture squarish, with rounded angles.—*Sower.* Min. Conch. t. clxvi.—In *Middle Oolite*, Berkshire.

27. A. *obtusa.*—Whorls 4, exposed; front with two slight furrows and an obtuse keel; ribs large, curved, sharpest in the middle; aperture oblong.—*Sower.* Min. Conch. t. clxvii.—In *Lias*, Lyme Regis.

28. A. *Brackenridgii.*—Depressed, front rounded, whorls 3, exposed; ribs prominent, numerous, sharp and furcate; lip expanded into two oblong lobes. —*Sower.* Min. Conch. t. clxxxiv.—*Under Oolite*, near Bristol.

29. A. *Brooki.*—Whorls 4 or 5, the inner ones half exposed, depressed, carinated, with a sulcus on each side the keel, ribs strong, simple, arched; aperture oblong.—*Sower.* Min. Conch. t. cxc.—In *Lias* at Lyme.

30. A. *Stokesi.*—Lenticular, depressed; inner whorls half exposed, keel crenated, ribs broad, undulated, and slightly elevated; aperture sagittate.—*Sower.* Min. Conch. t. cxci.—*Under Oolite*, Dorset.

31. A. *Herveyi.*—Gibbose, the inner whorl two-thirds concealed; ribs numerous, sharp, bi- or tri- furcated; aperture lunate, with obtuse angles.—*Sower.* Min. Conch. t. cxcv.—*Under Oolite*, near Spalden.

32. A. *Brocchii.*—Compressed, sides hollow; whorls 3 or 4, half concealed, very round, front circular, with many obtuse ridges; aperture lunate.—*Sower.* Min. Conch. t. ccii.—*Under Oolite.*

33. A. *annulata.*—Depressed, whorls 5 to 7, exposed, rounded; ribs numerous, prominent, divided on the front; aperture roundish.—*Sower.* Min. Conch. t. ccxxii.—In *Lias.*

34. A. *Lamberti.*—Depressed, inner whorls partly concealed, front sharp and crenated; ribs strong, obtuse, bent over the front, alternately long and short, rarely furcate; aperture lanceolate, short.—*Sower.* Min. Conch. t. ccxlii. f. 1, 2, 3.—*Upper Oolite*, Weymouth.

35. A. *Leachii.*—Depressed; inner whorls half concealed; front sharp and crenated; ribs undulated, curved over the front, often furcate; aperture ovate; like the preceding, but more gibbous, with fewer and more prominent ribs.—*Sower.* Min. Conch. t. cclxii. f. 4.—*Upper Oolite*, Weymouth.

36. A. *omphaloides.*—Gibbose, whorls increasing rapidly, inner ones half concealed, front rounded, broad; ribs prominent, waved, bent forward in the middle of the front, generally furcated; aperture transversely oblong.—*Sower.* Min. Conch. t. ccxlii. f. 5.—*Upper Oolite*, Weymouth.

37. A. *Strangewaysi.*—Discoid; whorls 5, exposed, margin flattened, carinated; inner edges of the whorls obliquely flattened; sides nearly flat, with an obscure concentric furrow; ribs twice furrowed; aperture oblong.—*Sower.* Min. Conch. t. ccliv. f. 1, 2, 3.—*Under Oolite*, Ilminster.

38. A. *falcifer.*—Discoid; inner whorls half exposed, margin convex, carinated; inner edge of the turns elevated and obtuse; ribs numerous, curved, and suddenly bent in the middle; aperture elliptical.—*Sower.* Min. Conch. t. ccliv. f. 2.—*Under Oolite*, Ilminster.

39. A. *Goodhalli.*—Discoid, carinated; both edges of the whorls gradually rounded; sides nearly flat; inner whorls two-thirds exposed; ribs large, undulated, irregular, obscurely tuberculated at each end; keel very prominent, thin; aperture oblong.—*Sower.* Min. Conch. t. cclv.—In *Green Sand*, Blackdown, Devonshire.

40. A. *Kœnigi.*—Discoid, convex, margin rounded, whorls 6, half exposed, marginal undulations numerous; central undulations few, very prominent; aperture cordate, elongated.—*Sower.* Min. Conch. t. cclxiii. f. 1, 2, 3.—*Middle Oolite*, Kelloway.

41. A. *triplicata.*—Discoid, whorls 5, exposed, with two or three oblique contractions; ribs straight, large, each divided into three as it passes over the rounded front; aperture suborbicular.—*Sower.* Min. Conch. t. ccxcii. ccxciii. f. 4.—*Middle Oolite.*

42. A. *biplex.*—Discoid, whorls 5, exposed, ribs numerous, small, obtuse, split over the rounded front; aperture oblong.—*Sower.* Min. Conch. t. ccxciii. f. 1, 2.—In *Clay*, but the formation unknown.

43. A. *rotunda.*—Discoid, ribs thick, numerous, split over the front, sides subventricose; aperture orbicular.—*Sower.* Min. Conch. t. ccxciii. f. 3.—*Upper Oolite.*

44. A. *decipiens.*—Discoid, depressed, whorls 5, exposed, rounded on the front, ribs large and few on the sides, numerous and small on the front; aperture orbicular.—*Sower.* Min. Conch. t. ccxciv.—In *Clay*, but the formation unknown.

45. A. *Parkinsoni.*—Whorls numerous, exposed; ribs numerous, elevated, slightly arched, bifid near the front, which is very narrow, and plain; aperture oblong.—*Sower.* Min. Conch. t. cccvii.—In *Lias*, Bath.

46. A. *dentata.*—Whorls increasing rapidly, inner ones much concealed, umbilicate, front square; ribs prominent, and forked near their commencement, terminating upon the edges of the front.—A. serratus (*Parkinson*, Trans. Geol. v. 57.) *Sower.* Min. Conch. t. cccviii.—*Chalk-Marl.*

47. A. *perampla.* — Discoid, whorls 4, half concealed, ventricose, front rounded, plain; ribs few, large, obtuse; aperture transversely oval.—*Mantell's* Fossils of the South Downs, p. 200.—*Sower.* Min. Conch. t. ccclvii.—In *Chalk*, South Downs.

48. A. *Lewesiensis.*—Whorls rapidly increasing in size, depressed, the inner ones half exposed; ribs large and obtuse; front narrow, rounded, plain; aperture sagittate.—*Mantell's* Fossils, p. 199. t. 22. f. 2.—*Sower.* Min. Conch. t. ccclviii.—In *Chalk*, Lewes.

49. A. *plicomphala.*—Discoid, umbilicate, with eight or ten diverging sharp ridges, extending over a part of the sides; front rounded, plain; aperture ovate. In the young state, the front is transversely furrowed.—*Sower.* Min. Conch. ccclix. and ccccciv.—In *Sandstone* (Middle Oolite ?) Bolingbroke, Lincolnshire.

50. A. *Smithii.*—Depressed, ribbed and keeled; inner whorls few, almost wholly exposed; ribs slightly curved; keel obtuse; sides flattened; aperture oblong.—*Sower.* Min. Conch. t. ccccvi.—In *Chalk Marl.*

51. A. *striatula.*—Discoid, carinated, radiated; sides of the whorls convex; the inner whorls exposed; radii numerous, slender, undulated; surface covered with minute striæ, parallel to the radii; aperture elliptical.—*Sower.* Min. Conch. t. ccccxxi. f. 1.—In *Marly Limestone*, Scarborough.

52. A. *subradiata.*—Lenticular, umbilicated, carinated, and radiated; radii twice curved, obscure, excepting near the margin, where they are bifid; umbilicus small; keel entire; aperture sagittate. — *Sower.* Min. Conch. ccccxxi. f. 2.—*Oolite*, between Bath and Bristol.

53. A. *parva.*—Discoid; surface marked with diverging, undulating, striæ; inner whorls exposed; front rounded: aperture oval —*Sower.* Min. Conch. t. ccccxlix. f. 2.—Tunbridge.

54. A. *læviuscula.*—Discoid, carinated, umbilicated, obscurely radiated; carina distinct; radii waved, alternately long and short, slightly elevated; umbilicus small, exposing part of the inner whorls; aperture sagittate.—*Sower.* Min. Conch. t. ccccli. f. 1. 2.—In *Oolite*, Dundry.

55. A. *corrugata.*—Discoid, carinated and umbilicated, strongly radiated; carina distinct; radii waved, sometimes furcated, elevated; umbilicus broad, exposing parts of the inner whorls; aperture obovate; front obtuse.—*Sower.* Min. Conch. t. ccccli. f. 3.—In *Oolite*, Dundry.

56. A. *Turneri.*—Depressed, radiated, carinated, a furrow on each side of the keel; inner whorls exposed; radii numerous, equal, curved towards the front; aperture oblong, quadrangular.—*Sower.* Min. Conch. t. ccccclii.—In *Lias*, Wymondham Abbey and Walchet.

*** *Whorls knobbed.*

57. A. *nodosa.*—Depressed, keeled, ribs straight for two-thirds of their length, then rising into a small knob, from which they extend towards the keel, curving upwards, rather distant, with a gentle concavity between them;

keel broad, obscure, crenulated within.—*Sower.* Min. Conch. t. xcii. f. 5.—In clay, *Middle Oolite*, Scarborough.

58. A. *bina.*—Depressed, keeled, whorls 4, the inner ones two-thirds exposed; ribs diverging in pairs from round tubercles, swelling and then turning up towards the front, and disappearing; aperture oblong rectangular, the angles rounded.—*Sower.* Min. Conch. t. xcii. f. 3.—*Plastic Clay*, Bramerton Norfolk.

59. A. *armata.*—Whorls 6, exposed, with many annular undulations, armed with two rows of large conical short furrowed spines; aperture obscurely four sided.—*Sower.* Min. Conch, t. xcv.—In *Lias*, Whitby.

60. A. *monilis.*—Whorls 4, exposed, subumbilicate, the outer margin rather depressed; ribs tuberculated, striated; aperture transversely ovate.—*Sower.* Min. Conch. t. cxvii.—*Green Sand*, Folkstone.

61. A. *aurita.*—Depressed, whorls 5, exposed, with obscure radiating undulations, tuberculated at their origin; back deeply channelled, bordered by large alternating compressed tubercles.—*Sower.* Min. Conch. t. cxxxiv.—In *Green Sand.*

62. A. *Duncani.*—Depressed, inner whorls partly exposed; edge flat, bounded by two rows of tubercles; ribs numerous, undulated, irregularly furcate; aperture ovato-sagittate.—*Sower.* Min. Conch. t. clvii.—In the clay of the *Middle Oolite.*

63. A. *vertebralis.*—Whorls 4, inner ones partly concealed, carinated; ribs numerous, prominent, tuberculate in the middle, then furcate, with a tubercle on each branch; keel serrato-tuberculate; aperture orbiculate.—*Sower.* Min. Conch. t. clxv.—In *Middle Oolite*, near Abingdon, Berkshire.

64. A. *Henleyi.*—Whorls few, increasing rapidly, the inner ones exposed; ribs numerous, with two compressed tubercles upon each; the ribs usually divided from the outer tubercle; aperture large, slightly round.—*Sower.* Min. Conch. t. clxxiii.—In *Lias*, Dorsetshire.

65. A. *rostrata.*—Shell depressed, carinated; whorls 4, exposed; ribs large, obtuse, with three or four tubercles, largest in front; aperture elliptical, with a compressed reflected beak.—*Sower.* Min. Conch. t. clxxiii.—In *Chalk Marl*, Oxfordshire.

66. A. *varians.*—Depressed, carinated, whorls 3, half exposed; a row of large tubercles near the front, and one or two rows of lesser tubercles placed upon furcate radiating undulations.—*Sower.* Min. Conch. t. clxxvi.—In *Chalk Marl.*

67. A. *inflata.*—Depressed, inner whorls exposed, carinated, sides and front flattish; ribs commencing with a compressed tubercle, then furcate; keel distinct; aperture square.—*Sower.* Min. Conch. t. clxxviii.—In *Green Sand*, Isle of Wight.

68. A. *rustica.*—Depressed; whorls 3; gibbose, exposed, with 6 or 8 conical tubercles upon the sides of each, and two rows of obtuse tubercles around the front, which is flat; aperture quadrangular.—*Sower.* Min. Conch. t. clxxvii. —In the *Lower Chalk*, near Lyme.

69. A. *Banksii.*—Whorls 5, exposed, sides concave, largely tuberculated; front fluted, slightly convex; aperture transverse, almost three times as long as wide.—*Sower.* Min. Conch. t. cc.—*Under Oolite.*

70. A. *Blagdeni.*—Subcylindrical, obtusely fluted, umbilicate; umbilicus reaching to the margin, conical, with large radii, terminating upon the edge

in a tubercle; apertures transverse, quadrangular, three times as wide as long.—*Sower.* Min. Conch. t. cci. (indistinct.)—*Under Oolite.*

71. A. *Sowerbii.*—Discoid, carinated, whorls 4, inner ones half concealed, about eight spiniform tubercles upon each whorl; keel round, entire; aperture elliptical. Var. *a.* aperture circular; keel sometimes impressed.—*Sower.* Min. Conch. t. ccxiii.—*Under Oolite.*

72. A. *Brownii.*—Discoid, inner whorls half exposed, with large tubercles on each side; marginal undulations many, central ones few, rising into tubercles; front rounded with a distinct keel; aperture cordate.—*Sower.* Min. Conch. t. cclxiii. f. 4, 5.—*Under Oolite*, Dundry.

73. A. *Birchi.*—Discoid, whorls 6, exposed, increasing gradually, sides concave, front rounded, transversely and obscurely sulcated; two involuted rows of spiniform tubercles; aperture transverse.—*Sower.* Min. Conch. t. cclxvii. —In *Lias* at Lyme.

74. A. *lauta.*—Discoid, inner whorls half concealed; front narrow, slightly concave; principal ribs slender, varicose or tuberculated near their commencement, shorter ribs alternating, united in pairs, to form compressed tubercles upon the edges of the front.—(*Park.* Trans. Geol. v. 58.) *Sower.* Min. Conch. cccix.—*Mant.* Suss. 91. t. xxi. f. 11.—*Chalk Marl.*

75. A. *tuberculata.*—Whorls gibbose, half concealed; front rather flat; ribs arising in threes from large round tubercles, and uniting in pairs to form large compressed tubercles upon each edge of the front; aperture suborbicular.—*Sower.* Min. Conch. t. cccx. f. 1, 2, 3.—*Chalk Marl.*

76. A. *proboscidea.*—Whorls ventricose, partly concealed; front concave, tubercles upon the sides of the last whorl, and both edges of the front subcylindrical; aperture orbicular.—*Sower.* Min. Conch. t. cccx. f. 4, 5.—*Chalk Marl.*

77. A. *Gulielmii.*—Lenticular, with a narrow front; whorls exposed; ribs dissimilar, terminating in small tubercles, principal ribs furnished with two tubercles near their commencement; aperture elliptical.—*Sower.* Min. Conch: t. ccxi.—*Middle Oolite.*

78. A. *Davœsi.*—Whorls exposed; sides nearly flat, with numerous ribs, and a few distant obtuse tubercles, each tubercle connected with about 4 sulci; aperture nearly orbicular —*Sower.* Min. Conch. t. cccl.—In *Lias*, Dorsetshire.

79. A. *Brodiæi.*—Largely umbilicate, gibbose; ribs radiating, large, numerous, terminating on the sides of the whorls by obtuse tubercles, front rounded, plicated; aperture transversely oblong, curved.—*Sower.* Min. Conch. t. cccli.—*Under Oolite.*

80. A. *perarmata.*—Depressed, whorls exposed; front rounded, armed with two concentric rows of large pointed tubercles, connected by obtuse ridges; aperture nearly orbicular.—*Sower.* Min. Conch. t. ccclii.—*Under Oolite.*

81. A. *mutabilis.*—Depressed; outer whorls compressed, plain and smooth; inner whorls two-thirds exposed, tuberculated, plicated; plicæ interrupted over the front; aperture ovato-sagittate.—In the young state the front is flattened.—*Sower.* Min. Conch. ccccv.—In *Clunch Clay* of the Middle Oolite near Horn Castle.

82. A. *subarmata.*—Depressed, concave, ribbed, inner whorls almost wholly exposed; ribs curved, often united in pairs by smooth spines; aperture transversely oblong, arched; the spines disappear on the last whorl.—(*Young* and *Bird's* Geol. of York. 250. t. 13. f. 3.) *Sower.* Min. Conch. t. ccccvii. f. 1.—*Lias*, Whitby.

83. A. *fibulata*.—Depressed, ribbed; inner whorls almost wholly exposed, sides of the whorls flattened, their inner margins plain; ribs numerous, united in pairs by smooth solid spines.—*Sower.* Min. Conch. t. ccccvi. f. 2.—In *Lias* at Whitby.

84. A. *catena*.—Depressed, furnished with two rows of short tubercles upon each side; whorls 6 or 8, smooth, with flat sides, the inner ones exposed; front rather convex; aperture square. —*Sower.* Min. Conch. t. ccccxx.—*Middle Oolite*, near Abingdon, Berkshire.

85. A. *cristata*.—Lenticular flattened; carinated; keel thin, deeply notched; inner whorls concealed.—*Sower.* Min. Conch. t. ccccxxi. f. 3.—*Middle Oolite*, Weymouth.

86. A. *Johnstoni*.—Discoid; whorls 6 or 8, two-thirds exposed, with numerous short straight costæ upon the exposed parts; front plain.—*Sower.* Min. Conch. t. ccccxlix. f. i.—In *Lias* at Watchet.

87. A. *varicosa*.—Depressed, costated; inner volutions exposed; carinated when young, and furnished with an irregular row of tubercles upon the inner edges of the whorls; costæ curved, large, obtuse, in old shells crossing the front; carina distinct; aperture oblong.—*Sower.* Min. Conch. t. ccccli. f. 4, 5.—*Sandstone*, Blackdown.

88. A. *rotiformis*.—Depressed, ribbed, carinated, a furrow upon each side of the keel; inner whorls exposed, many; ribs many, strong, each terminating in a tubercle; aperture nearly square.—*Sower.* Min. Conch. t. ccccliii.

89. *A. multicostata*.—Depressed, costated, carinated, a furrow on each side of the keel; inner whorls exposed, few; ribs strong, sharp, numerous, with a tubercle near the end of each; aperture oblong.—*Sower.* Min. Conch. t. ccccliv.—In *Lias*, near Bath.

90. *A. Humphriesiana*.—Discoid, thick, radiated; inner whorls exposed; front rounded; radii large, numerous, rising into a tubercle on each side the whorl, where they branch into three; aperture arched, oblong. *Sower.* Min. Conch. t. D. f. I.—*Inferior Oolite*, Sherborne.

91. *A. contracta*.—Subglobose, umbilicated, radiated; radii rising into tubercles upon the border of the umbilicus, there dividing into three or four branches that pass over the much rounded front; aperture oblong, arched; inner whorls almost concealed.—*Sower.* Min. Conch. D. f. 2. *Dundry*.

92. *A. Listeri*.—Subdiscoid; inner whorls partly concealed; front convex, broad, crossed by numerous small ribs; sides inversely conical, ribbed; ribs terminated by tubercles.—*Mart.* Pet. Derb. t. xxxv. f. 3.—*Sower.* Min. Conch. DI. f. 1.—*Carboniferous Limestone*.

93. *A. longispina*.—Discoid, thick, with two concentric rows of spines upon each side; whorls few, half exposed; front round.—*Sower.* Min. Conch. t. DI. f. 2.—*Weymouth*.

94. *A. Taylori*.—Discoid, radiated; inner whorl exposed; radii about 12, with one large spiniform tubercle upon each side of the front, and one or two slight elevations on the rounded sides of the whorls; aperture nearly round.—*Sower.* Min. Conch. t. D. xiv. f. 1.—*In clay*, *Happisburg Cliff*.

95. *A. hippocastanum*.—Gibbose, umbilicated, radiated, spinose; inner whorls almost concealed; radii ten or more, unequal, much elevated, each furnished with three tubercles upon the front, and most of them with two obtuse spines upon each side; aperture transversely ovate.—*Sower.* Min. Conch. t. DXIV. f. 2.—In *chalk*, Dowlands.

96. *A. rhotomagensis.*—Discoid, radiated, umbilicated; inner whorls partly concealed; radii about 20, furnished with three short tubercles upon the front, and two, more or less elevated, upon each side; whorls thick, with flattish sides; aperture oblong. *Cuv.* Oss. Foss. ii. 319. t. vi. f. 2. A. Sussexiensis, *Mantell.* Suss. 114. t. xx. f. 2. t. xxi. f. 10. A. rhot. *Sower.* Min. Conch. t. DXV. —*Chalk-marl.*

97. *A. Benettiana.*—*Sower.* Min. Conch. t. DXXXIX.—No description as yet given.

98. *A. biplicatus.*—Depressed, slightly umbilicate; volutions inserted, transversely radiated; rays prominent, curved, bifurcated, arising from a row of oblong projections on the inner edge of the volutions, and terminating in tubercles on the outer margin; carene flat, bordered by alternating, compressed tubercles.—*Mant.* Suss. 91. t. xxii. f. 6.—In *blue chalk-marl.*

99. *A. Woollgari.*—Discoidal, depressed, volutions one-third inserted, transversely costated: costæ remote, slightly curved, inclined towards the aperture, terminating on the outer margin, in compressed tubercles, or spinous projections; carene acute, deeply serrated.—*Mant.* Suss. 197. t. xxi. f. 16. t. xxii. f. 7.—*Upper chalk.*

100. *A. planorbis.*—Discoid, smooth; whorls two or four, two-thirds exposed *Sower.* Min. Conch. t. ccccxlviii.—In *Lias*, at Walchel. Probably not of the genus, or even of the group Cephalopoda.

It is probable that not a few of the preceding species will, upon more accurate comparison, be degraded to the rank of *varieties.* The following observation by Mr Sowerby merits attentive consideration. "There appears to be no regular rule amongst Ammonites for their change of form, some becoming more globose, and others more compressed by age; but they generally lose some of the ornaments from their last whorls; and, in their infant state, are also smooth, or free from tubercles." t. 405.

* * *

GEN. ORBULITA.—Sides equal, the last whorl embracing and concealing the previously formed ones.

1. O. *disca.* — Discoid, outer edge acuminated; aperture sagittate, half the diameter of the shell in length, and one-sixth in breadth.—Ammonitis discus, *Sower.* Min. Conch. t. xii.—In limestone of the *Lower Oolite*, Bedford.

2. O. *striata.*—Discoid, gibbose, obscurely undulated, finely striated longitudinally; septa rather distinct, with four large angular folds. Aperture semicircular, with nearly parallel edges; siphunculus marginal; a deep central cavity.—Am. str. *Sower.* Min. Conch. t. liii. f. 1.—In *Carboniferous Limestone*, Derbyshire. In the Min. Conch. it is stated, at t. 130, that Dr Buckland has found this species in *Transition Slate* at Filliagh, near South Molton, Devonshire.

3. O. *sphærica.*—Orbicular, umbilicate; septa with four broad angular folds; aperture narrow; syphon on the inner margin. — Conchyliolithus Nautilus sphæricus, *Martin*, Pet. Derb. t. vii. f. 3, 4, 5. Am. sph. *Sower.* Min. Conch. t. liii. f. 2.—*Carboniferous Limestone*, Derbyshire.

4. O. *minuta.*—Orbicular, with about 24 distant longitudinal striæ; aperture lunate, rounded at the sides.—Am. min. *Sower.* Min. Conch. liii. f. 3.—In *Chalk Marl*, Folkstone.

5. O. *modiolaris.*—Orbicular, central cavity large, with an angular edge, exposing the inner whorls; septa numerous, with five principal undulations,

which are repeatedly divided into many lesser rounded ones; aperture semicircular, truncated at the sides; syphon at the outer margin.—Naut. mod. *Luidii*, Ichn. t. vi. f. 292, p. 19. Am. sublævis, *Sower.* Min. Conch. t. liv.—In limestone, *Middle Oolite*, at Christian Malford and Kellaways.

6. O. *Luscombi.*—Depressed, umbilicated; front rounded; ribs many, shallow, waved, surface smooth; aperture oblong.—*Sower.* Min. Conch. t. clxxxiii.—In *Lias*, at Lyme.

7. O. *Brongniarti.*—Gibbose umbilicate; ribs bent, furcate; aperture transverse, oblong, arched, with a thick or inflected lip.—*Sower.* Min. Conch. t. clxxxiv. A. f. 2.—*Under Oolite*, at Yeovil.

8. O. *heterophylla.*—Lenticular, umbilicated, striated; sinuosities of the septa of two kinds, small and acute-angular, or large and ovate; front rounded; sides convex; aperture elliptical, with a notch for the reception of the preceding whorl.—*Sower.* Min. Conch. t. cclxvi.—In *Lias*, Whitby.

9. O. *Bechii.*—Gibbose, umbilicated, concentrically striated; with numerous thin ribs; front rounded; each side furnished with two rows of numerous small tubercles; aperture large.—*Sower.* Min. Conch. t. cclxxx.—In *Lias*, at Lyme.

GEN. SCAPHITA.—Shell commencing with a depressed volution, the last turn of which, after being enlarged and elongated, is diminished and reflected inwards.

1. S. *æqualis.*—Involute, umbilicate, the inner whorls concealed; surface with projecting distant ribs extending all round the whorl; outer part rounded, with about two projecting striæ between and equal to each of the radii; outer whorl ventricose, the ribs upon it much enlarged, and abruptly terminated before they reach the edge.—*Sower.* Min. Conch. i. xviii. f. 1, 2, 3.—*Green Sand*, Yeovil.

2. S. *obliqua.*—Obliquely involute, umbilicated, inner whorls concealed, covered by transverse striæ, dividing into two or three near the outer half of the whorl, which is rather flattish and broad, and uniting again on the other side.—*Park.* Or. Rem. iii. p. 145. t. x. f. 10.—*Sower.* Min. Conch. tab. xviii. f. 4, 5, 6, 7.—In *Chalk.* In the Geology of England and Wales, p. 268 it is stated as an inmate of the *Lias* beds.

3. S. *striata.*—Volutions transversely striated; striæ numerous, oblique, annular, bifurcate; dorsum tumid; aperture produced, transversely ovate, marginate; siphunculus internal?—*Mant.* Suss. 119. t. xxii. f. 3.—In *Grey Chalk Marl.*

4. S. *costata.*—Volutions convex, laterally compressed, transversely striated, inner whorls concealed, inserted; striæ furcate, numerous, embracing the ambit: sides of the outer volutions smooth, with eight or ten distant, oblique, nodular projections; dorsum broad, convex.—*Mant.* Suss. 120. t. xxii. f. 8–12.—*Grey Chalk Marl.*

GEN. TURRILITA.—Whorls contiguous, partitions of the chambers sinuous, perforated.

* *Spires sinistral.*

1. T. *costata.*—Whorls beset with short ribs, beneath which are two rows of smaller tubercles.—*Sower.* Min. Conch. t. xxxvi.—In *Chalk Marl* and *Green Sand.*

2. T. *tuberculata.*—Whorls beset with one row of large obtusely conical tubercles, and three rows of smaller tubercles below them.—*Sower.* Min. Conch. t. lxxiv.—*Chalk Marl.*

3. T. *undulata.*—Whorls with many undulating ribs, mostly continuing from the upper to the lower part of each.—*Sower.* Min. Conch. t. lxxv. f. 1, 2, 3.—*Chalk Marl.*

** *Spires dextral.*

4. T. *obliqua.*—Upper part of ths whorls contracted; below the middle is placed a row of large oblique tubercles.—*Sower.* Min. Conch. t. lxxv. f. 4.—In *Green Sand.*

GEN. BACULITA.—Shell hooked or bent into two parallel limbs; syphon near the outer edge—*Hamites* of Parkinson and Sowerby.

* *Without spines or tubercles.*

1. B. *compressa.*—" Depressed, curved at right angles; undulations sharp, slightly waved, most prominent at the back.—*Sower.* Min. Conch. t. lxii. f. 7. 8.—In *Chalk Marl*, Folkstone.

2. B. *tenuis.*—Slender, depressed, undulation obtuse, slightly waved, disappearing on the back of the limbs. The undulations are irregular, some reaching nearly to the back, others only half way; tapering.—*Sower.* Min. Conch. t. lxi. f. 1.—In clay in the *Chalk Marl*, Folkstone.

3. B. *rotunda.* — Aperture round, undulations obtuse, annular, numerous; the curve of the shell very gradual.—*Sower.* Min. Conch. t. lxi. f. 2, 3. —*Chalk Marl*, Folkstone.

4. B. *attenuata.*—Suddenly attenuated just below the curve; undulations obtuse, numerous.—*Sower.* Min. Conch. t. lxi. f. 4, 5.—*Mant.* Suss. 93. t. xix. f. 29.—*Chalk Marl*, Folkstone.

5. B. *maxima.*—" Slightly depressed; undulations even, rounding, disappearing at the back; curvature gradual." (S.)—*Parkinson's* Organic Remains, iii. p. 144. t. x. f. 4. *Sower.* Min. Conch. t. lxii. f. i.—*Chalk Marl*, Folkstone.

6. B. *intermedia.*—" Depressed, undulations obtuse, annular, waved, curvature rounding." (S)—*Park.* Org. Rem. iii. p. 143. t. x. f. 1, 2.—*Sower.* Min. Conch. t. lxii. f. 2, 3, and 4, except the right hand figure.—In *Chalk Marl*, Folkstone.

7. B. *gibbosa.*—" Gibbous, undulations acute, prominent at the front, rather distant." Very flat at the back.—*Sower.* Min. Conch. t. lxii. f. 4. right hand figure.—*Chalk Marl*, Folkstone.

8. B. *Parkinsoni.*—Curvature obtuse, annulations distinct.—*Park.* Org. Rem. iii. p. 144. t. x. f. 5.—In *Green Sand*, Wiltshire.

The *Hamites adpressus* of *Sower.* Min. Conch. t. lxi. f. 6. " Aperture round, lesser limb acute, pressed close to the larger; no undulations; septa? distant. not waved," from Folkstone, is a shell still in obscurity.

** *With spines or tubercles.*

9. B. *armata.*—" Flatted; undulations simple, every second or third armed with a large thick spine on each side near the front."—*Sower.* Min. Conch. t. clxviii. and t. ccxxxiv. f. 2.—In *Chalk Marl*, Oxfordshire and Sussex.

10. B. *spinulosa.*—" Depressed, undulations regular, every other one armed with two sharp spines; ;opening elliptical; curvature very gradual;" structure obscure.—*Sower.* Min. Conch. t. ccxvi. f. 1.—*Green Sand*, Blackdown.

11. B. *spiniger.*—" Depressed; undulations many, slender; two rows of sharp tubercles upon each side, those nearest the front largest; curvature gradual."—*Sower.* Min. Conch. t. ccxvi. f. 2.

12. B. *tuberculata.*—" Depressed; undulations unequal, every third one largest, with two tubercles on each side, the lateral ones obscure; curvature gradual."—*Sower.* Min. Conch. t. ccxvi. f. 4, 5.—*Chalk Marl*, Folkstone.

13. B. *turgida.*—" Depressed; front irregularly swelled; undulations regular, disappearing over the back; two rows of obscure tubercles near the front; curvature rather sudden."—*Sower.* Min. Conch. t. ccxvi. f. 6.—*Chalk Marl*, Folkstone.

14. B. *nodosa.*—" Nearly round, undulations regular; two rows of obtuse tubercles upon the front, each tubercle placed upon two undulations; aperture obovate."—*Sower.* Min. Conch. t. ccxvi. f. 3.—*Chalk Marl*, Folkstone.

15. B. *plicatilis.*—" Slightly depressed, with numerous annular ridges; two rows of large, equal, flat tubercles upon each side; curvature gradual.—*Sower.* Min. Conch. t. ccxxxiv. f. 1.—*Chalk Marl*, Warminster.

GEN. AMPLEXUS.—Nearly cylindrical, divided into chambers by numerous transverse septa, which embrace each other with their reflexed margins.

1. A. *coralloides.*—Tube irregularly bent, longitudinally striated; margins of the septa deeply reflected, and regularly plaited. The septa seem to have no perforations.—*Sower.* Min. Conch. t. lxxii.—*Transition Limestone*, Cork.

* * *

[The following extinct species in the genera Nautilus, Nummulita, and Orthocera, are here added, having been omitted at their proper places at pp. 229, 233, and 238.]

1. *Nautilus expansus.*—Subglobose, umbilicated, finely striated; umbilicus small; sides of the aperture expanded.—*Sower.* Min. Conch. t. cccclviii. f. 1. —*Chalk Marl*, Hamsey.

2. N. *biangulatus.*—Discoid, subglobose, with a large umbilicus, and a keel upon each side; front rounded.—*Sower.* Min. Conch. t. cccclviii. f. 2.—In *Mountain Limestone*, Bristol.

3. N. *globatus.*—Subglobose, smooth, umbilicated; whorls few, inner ones concealed, rather flattened on the front, rapidly increasing; umbilicus deep, with an angular margin; aperture very wide, arched, with a deep sinus in the front.—*Sower.* Min. Conch. t. cccclxxxi.—Probably my *N. Wrightii* is identical with this species.—From Cork.

4. N. *multicarinatus.*—Discoid, subglobose; inner whorls half exposed in a large deep umbilicus; edge of the umbilicus angular; front compressed with several carinæ on each side the middle.—*Sower.* Min. Conch. t. cccclxxxii f. 1, 2.—*Transition Limestone*, Cork.

5. N. *carinatus.*—" Discoid, subglobose; inner whorls half exposed, in a large umbilicus; a keel in the middle of each side, and two ridges between it and the flattened front."—*Sower.* t. cccclxxxii. f. 3.—Identical with *N. excavatus* already described.

6. *Nummulita elegans.*—Compressed ,smooth; whorls about six; septa gently curved from the axis, numerous; aperture rather prominent.—*Sower.* Min. Conch. t. DXXXVIII. f. 2.—Emsworth.

7. N. *variolaria.*—Very convex, minute, smooth; edge obtuse; whorls four or five, with about twenty septa, forming rays near the margin. (*Lenticulites variolaria* of Lamarck), *Sower.* Min. Conch. t. DXXXVIII. f. 3.—*London Clay.*—The *Nautilus Comptoni* is now arranged by Mr Sowerby in the genus *Nummulita.*

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Orthocera paradoxa.—Lanceolate, curved, three-angled, with a flat front, and convex sides; aperture an equilateral triangle; siphuncle nearly central. —*Sower.* Min. Conch. t. CCCCLVII.

SEPIADÆ.

I. *Head surrounded with eight arms and two feet.*

Sepia.
Loligo.

II. *Head surrounded with eight arms, but destitute of feet. The arms equal.*

Octopus.

GEN. X. SEPIA.—The sac furnished with a narrow fin on each side throughout its whole length.

40. S. *officinalis.* Cuttle-bone.—Body smooth, arms pedunculated, lengthened; dorsal plate elliptical.

S. supina, *Jonst.* Exang. t. i. f. 3.—S. off. *Linn.* Syst. i. 1095. *Amœn.* Acad. i. 609. *Penn.* Brit. Zool. iv. 55.—Not common.

Body oval, compressed, whitish, with purple dots. Arms nearly as long as the body, dilated towards the extremity, and covered with suckers. The dorsal plate, known in the shops under the name of Cuttlebone, was formerly used in medical practice as an absorbent. This plate is occasionally thrown ashore on all parts of the coast, but the living animal is seldom found.

GEN. XI. LOLIGO. CALAMARY.—Sides of the sac only furnished partially with fins.

* *Fins united with the tail on each side.*

41. L. *vulgaris.*—The fins, together with the tail, forming a rhomboidal expansion.

Loligo, a Sleeve, *List.* Conch. Tab. Anat. ix. f. s. *Borl.* Corn. 260. t. xxv. f. 27.—Sepia Lol. *Linn.* Syst. i. 1196. *Penn.* Brit. Zool. iv. 53. —Not rare.

Body compressed, whitish, with dark spots; these spots in the living animal, and even in a portion of the skin when detached, exhibit remarkable contractions and dilatations, as in other species of the class. The feet are nearly of the same length as the body, and covered with suckers towards their distal extremity. There is no eye-lid. The bone is elliptical, elongated, produced at the upper extremity, a groove along the middle, the edges thin. The appendage to the stomach is straight, and the oviduct is single.

42. L. *sagittata.*—The fins with the tail forming a triangular expansion.

Sepia Loligo, *Monro*, Phys. of Fishes, p. 62. t. 41. and 42.—L. sagit. *Lam.* An. sans Vert. vii. 665. *Flem.* Edin. Encyc. xiv. 610.—Common in the Scottish seas.

The feet are shorter than the body, and covered with suckers nearly to the base. The two arms between the feet, and the two dorsal ones, are the smallest. The skin surrounding the mouth unconnected with the two feet and the two dorsal arms, though united at the base between them. Suckers in two rows. A duplicature of the skin round the eye forming an eyelid. The dorsal plate or bone is narrow, thin, expanded at both ends, and strengthened by one central and two marginal ribs. The appendage to the stomach is spiral, and the oviduct is double.

** *Fins occurring near the tail, but not continued to its extremity.*

43. L. *media.*—Body long, fins elliptical, tail pointed.

Sepia med. *Linn.* Syst. i. 1095. *Penn.* Brit. Zool. iv. 54. t. xxix. f. 45. —Rare.

Body slender, almost transparent, cylindrical; arms with a double row of suckers. Eyes large, blue.

44. L. *Sepiola.*—Body short, fins thin and rounded, outline of the tail semicircular.

Sepia Sep. *Linn.* Syst. *Penn.* Brit. Zool. iv. 54. t. xxix. f. 46.—Rare.

Body scarcely exceeding an inch in length, and about ⅔ds in breadth. Arms with two rows of pedunculated suckers; those on the feet small, and confined to an oblong disc near the extremity.—This seems to be a rare species. Pennant obtained it from the Flintshire coast. A specimen in my possession was found in the Frith of Forth, and presented to me by Mr Chalmers, surgeon, Kirkcaldy, and another specimen has subsequently been found in the Forth by Dr Grant. It was observed by Captain Parry in Davis' Straits.

GEN. XII. OCTOPUS.—Suckers sessile.

45. O. *vulgaris.*—Body smooth; suckers a little remote, arranged in a double row.

Sepia octopus, *Sower.* Brit. Misc. t. xliii.—Oct. vul. *Lam.* An. sans Vert. vii. 657.

Body oblong, tinged with brown. Arms nearly six times the length of the body, and furnished with about two 240 suckers. Oviduct double; margin of the anus simple.—This species is recorded by Mr Sowerby as having been sent to him from Dover by Mr Richard Phillips. It occurs, according to the observations of Mr Neill and Dr Grant, in the Frith of Forth, not unfrequently.

46. O. *octopodia.*—Body rounded, smooth, mantle connected with the head behind; suckers sessile, arranged in a single row.

Sepia Oct. *Penn.* Brit. Zool. iv. 53. t. xxviii. f. 44.

This species appears to have been confounded with the preceding. Pennant states, that it inhabits our seas; and Montagu is said, by Mr Sowerby, to have communicated a specimen to him, probably from the coast of Devon.

Dr Grant has obligingly communicated to me the following observations on a recent, apparently full grown specimen from the Frith of Forth, presented to him by Mr John Coldstream. Length of the body 4½ inches, of the head 2 inches; breadth of the body 3½ inches; arms 12 inches long, webbed at the base as high as the twelfth sucker, compressed, strong, the extremities filiform. Suckers becoming larger to the sixth, and then diminishing towards the extremity, with a broad muscular margin; about 111 can be counted, with the aid of a lens, on each arm. Eyes very small, with a subdorsal aspect, and near covered with distinct eyelids, and having the iris white. The absence of the musky smell distinguishes this species from the *Octopus moschatus* of Lamarck.

* * *

The different species of Sepiadæ secrete an *inky fluid*, differing, however, in the shade of colour according to the species, which they eject upon being pursued or captured.

* * *

The collection of Mr Miller of Bristol is said to contain a specimen, from the *Lias*, resembling the back of one of the Sepiadæ.—Geol. Eng. and Wales, 267.

PULMONIFERA.

TERRICOLA.

Tentacula usually round, and four in number. The eggs are hatched on land.

I. Limacidæ. *Cloak and foot parallel, enclosing the viscera.*

- *a.* Pulmonary cavity placed near the head, covered by a thick shield.
  - Arion
  - Limax.
- *aa.* Pulmonary cavity near the tail, covered by a spiral open shell.
  - Testacella.

II. Cochleadæ. *Cloak and foot not parallel; the viscera contained in a spiral, dorsal protuberance, protected by a shell.*

- *a.* Foot with a lid for closing the mouth of the shell.
  - Cyclostoma.
  - *Helecina.*
- *aa.* Foot destitute of a lid.
  - *b.* Helicidæ. Last formed whorl larger than the penultimate one.
    - *c.* Animal capable of retiring within the shell, the peristome of which, with the exception of Achatina, becomes thick at maturity.
      - *d.* Shell depressed or globose.
        - *e.* Peristome entire, raised on the pillar.
          - Carocolla.
        - *ee.* Peristome interrupted on the pillar.
          - Helix.
      - *dd.* Shell turrited.
        - Bulimus.
        - Achatina.
    - *cc.* Animal incapable of withdrawing within the aperture of the shell, the margin of which is thin.
      - Succinea.
      - Vitrina.
  - *bb.* Pupadæ. Last formed whorl nearly of the same size as the penult one, or even less, giving the shell a subcylindrical form.
    - *c.* Whorls dextral
      - Pupa.
      - Azeca.
      - Carychium.
    - *cc.* Whorls sinistral.
      - Balea.
      - Clausilia.
      - Vertigo.

LIMACIDÆ.

GEN. XIII. ARION.—A mucous orifice at the retral termination of the cloak; shield strengthened by soft calcareous matter.

47. A. *ater.*—Tentacula and snout black; body generally of the same colour.

Limax ater, *List.* An. Ang. 131. Conch. t. 101. f. 102, and t. 101. a. f. 103. *Mull.* Verm. Hist. ii. p. 2.—Arion ater, *Ferussac*, Hist. Moll. i. 60. t. i. f. 1–3.—Common.

Body rounded above, becoming ridged towards the tail. Shield granulated; cloak with numerous anastomosing furrows, the margin with transverse parallel ridges. Orifice of the pulmonary cavity near the anterior margin of the shield, with the sexual orifice underneath. Deposits its bluish eggs in a cluster in May at the roots of plants. Feeds on dead and living vegetables; and even on the common earthworm when dead, according to Mr Power.—*Linn.* Trans. ix. 323—This species is subject to considerable variation of colour, being sometimes of a brownish tinge (Limax rufus); or with the margin of the cloak reddish or yellowish.

GEN. XIV. LIMAX.—No mucous orifice; shield strengthened by a shelly plate; the pulmonary cavity and sexual orifice under the right tentaculum.

48. L. *cinereus.*—Grey, with dark brown spots; tentacula veined.

List. An. Ang. 127. Conch. t. 101. a. f. 104. *Mull.* Verm. Hist. ii. p. 3. *Fer.* Hist. Moll. i. 65. t. iv.—Common.

Length 5 or 6 inches, Three black lines between the tentacula. Shield nearly smooth; the cloak with branched furrows. The foot whitish. Shell of the shield white, smooth, depressed, and translucent. Eggs white, deposited in spring, under stones. Food vegetables. Varies much in the colouring. Lives in old damp walls, and shaded places.

49. L. *agrestis.*—Grey, clouded, tentacula black.

L. cin. parvus, *List.* An. Ang. 130. Conch. t. 101. f. 101.—L. ag. *Mull.* Verm. Hist. ii. p. 8. *Fer.* Hist. Moll. i. 73. t. v. f. 7–10.—Common.

Length about an inch. Tentacula short. Body convex above, ending in a ridge at the tail. Shell of the shield oval, pellucid. When touched its body becomes covered with a white mucus. Lurks under stones and rotten timber.—This species is capable of forming a thread, and suspending itself from trees, a kind of locomotion in the slugs, first noticed by Lister *An. Ang.* 3., and afterwards by other observers, *Linn. Trans.* vol. i. 182, and vol. iv. p. 85.

M. Ferussac adds as a synonime to his L. *flavus*, " lutescens, fusco tesseratus, tentaculis cœruleis; clypeo postice rotundata," i. p. 71. t. v. f. 1–6, a reference to Pennant's Brit. Zool. iv. 41, where, under the name Yellow Slug, a species is described " of an amber colour, marked with white." This is obviously the "Limax succini colore, albidis maculis insignitus," of Lister, Conch. t. 101. 6., but as the letter A is not placed at the figure, which is the usual mark of an English species, there is no evidence of its being native.

GEN. XV. TESTACELLA. — Vent and pulmonary cavity nearly terminal. Foot extending on each side beyond the body.

50. T. *Maugii.*—Reddish, with scattered brown spots, and a stripe of brown on each side.

Fer. Hist. Moll. i. 94. t. viii. f. 10–12. *Miller*, Annals of Phil. xix. 380. —In nursery grounds, Bristol.

Tentacula filiform; mouth orange. Shell ovate, lengthened, convex, covered with a dusky cuticle, striated by the layers of growth; rounded and effuse anteally, ending retrally in a short spine, with a slightly prominent knob; margin of the opening entire, subquadrangular.—This species was observed by Mr T. Drummond (at present engaged in exploring the Arctic Botany of North America) in 1812, in the nursery grounds of Messrs Sweet and Miller. Specimens were transmitted by Dr Leach to Baron Ferussac. It feeds on the earth worm, into the holes of which it effects its entrance. Eggs few, ovate. It inhabits Teneriffe, and was probably introduced along with exotic plants.

51. T. *haliotoidea.*—Greyish clouded, or reddish, without spots.

Draparnaud, Hist. Nat. des Mollusques, p. 121. t. ix. f. 12, 13. *Fer.* Moll. i. 94. t. viii. f. 5–9.—T. scutata, *Sower.* Gen. Ric. Shells, 1, 3, 6. ---In a garden at Lambeth.

Tentacula cylindrical; a groove on each side, from the head to the shell. Shell ovate, depressed, rounded anteally, thick, brown, striated by the layers of growth: acuminated retrally, with an imperfect spire, in the form of a minute light coloured knob.—This species was found in Mr Sowerby's garden at Lambeth. The specimens obligingly presented to me by Mr J. C. Sowerby, incline me to consider them as identical with the species long ago described by Draparnaud. In the description Mr G. B. Sowerby adds, "the animal of this species bears a near resemblance to that of T. *haliotoidea*, not having the double row of tubercles running from the head to the anterior part of the shell so conspicuous in T. *Maugii.*"

COCHLEADÆ.

GEN. XVI. CYCLOSTOMA.—Peristome of the shell thickened, entire. Tentacula linear, subretractile, the second pair minute, bearing the eyes.

52. C. *elegans.*—Whorls 5, ventricose, spirally and longitudinally striated.

Cochlea cinerea, *List.* An. Ang. 119, Conch. t. xxvii. f. 25.—Nerita elegans, *Mull.* Hist. Verm. ii. 177.—Turbo tumidus, *Penn.* Brit. Zool. iv. p. 128.—Turbo elegans, *Mont.* Test. Brit. 343.—Cycl. el. *Drap.* Moll. 32.—Under moss and the roots of ferns, England.

Length of the shell upwards of half an inch, brownish, spiral striæ distinct; a minute pillar cavity; lid diverging, striated. The animal is brownish, with a long emarginate snout. Some details of anatomical structure are given by Lister, Tab. Anat. iv. f. 1, 2, 3.

53. C. *subcylindricum.*—Whorls 4 to 5, cylindrical, summit obtuse, with numerous rounded transverse ridges.

Helix subcylindrica, *Pultney's* Dorset. 49.—C. truncatulum, *Drap.* Moll. 40.—On marsh plants.

Length of the shell a quarter of an inch; colour brown, mouth ovate, peristome thick, pillar cavity indistinct: summit as if truncated, ending suddenly in a small smooth button-like whorl. The animal, according to Draparnaud, is white, transparent, with a long contractile snout: tentacula short, little acuminated; eyes above the retral base of the tentacula; foot short; lid thin, semioval, with bent striæ. Dr Pultney found his on "water plants in rivers and ponds." Draparnaud states, that it is found on the shores of the Mediterranean, on the borders of marshes, on the earth among plants, and even burried in sand; and expresses a suspicion that it may prove a marine shell. In 1806 I found a specimen in the cavity of a dead *Spatangus purpureus* from the Frith of Forth. This species is probably the "Buccinum exiguum rufum quinque orbium" of *List.* Conch. 22. f. 19.—Donovan, in his Brit. Shells, t. lxxx, figures this species, by mistake, for Pupa muscorum.

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EXTINCT.

GEN. HELECINA.—Peristome entire, with a callous pillar.

1. H. *compressa.*—"Spire flattish, an elevated thread surrounding the upper part. Mouth a little angular above."—*Sower.* Min. Conch. t. x. three middle figures.—In *Lias* limestone, Leicestershire.

2. H. *expansa.*—"Carinated; above, depressed, conical, obscurely striated; beneath, ventricose; callus expanded."—*Sower.* Min. Conch. t. cclxxiii. f. 1–3. —*Blue Lias* at Lyme.

3. H. *solarioides.*—"Subdiscoid, obtusely carinated; whorls depressed above, convex beneath."—*Sower.* Min Conch. t. cclxxiii. f. 4.—In *Lias.*

4. H. *polita.*—Subdiscoid, polished; spire elevated, acute; volutions marked with an impressed band, depressed above, below ventricose; callous, thin, expanded; aperture nearly square.—*Sower.* Min. Conch. t. cclxxxv.—At Copredy, in marly sandstone of the *Lower Oolite.*

GEN. XVII. CAROCOLLA.—Shell carinated, mouth transverse, not reversed.

54. C. *lapicida.*—Shell convex, transversely striated; peristome reflected, white.

Cochlea pulla, sylvatica, spiris in aciem depressis, *List.* An. Ang. 127, Conch. t. 69. f. 68.—Helix lap. *Linn.* Syst. i. 1241. *Drap.* Moll. iii. *Mont.* Test. Brit. 435.—Woods and old walls, England.

Shell depressed, ¾ths of an inch in breadth; brown, variegated, rough. Whorls five, nearly flat, carinated. Pillar cavity large, exposing part of the inner volutions; mouth subovate, Animal dark brown; upper tentacula very long, the lower short and slender; neck shagreened. Is not the *Helix Somershamiensis* of the Reverend R. Sheppard, Linn. Trans. xiv. 159, the young of this species? The shell described by Captain Brown under the name *Helix cochlea*, Wern. Mem. ii. 528. t. xxiv. f. 10, and by Dr Turton, H. *terebra*, Conch. Dict. 61. t. xiv. f. 55, found in the garden of Trinity College, Dublin, by Mr Stevens, seems to be a produced variety of this shell, the effect of disease in early life.

GEN. XVIII. HELIX.—Shell globose, aperture without teeth, transverse, lunated.

a. With a pillar cavity.

* *Preceding whorls not exposed by the pillar-cavity.*

55. H. *Pomatia.*—Shell inflated, yellowish-brown, with three dark longitudinal bands; wrinkled transversely.

Cochlea cinerea, *List.* An. Ang. iii.—Conch. t. 48. f. 46.—H. Pom. *Linn.* Syst. i. 1244. *Mont.* Test. Brit. 405.—Middle districts of England.

The shell sometimes attains two inches in diameter. Whorls 5, rounded. Animal dusky grey. Eggs from 25 to 50, deposited in a hole in the earth; when hatched, the shell has one volution and a half.—Previous to winter, this species retires to a cavity, which it diggs in the earth by means of its foot, aided by the mucus, and closes the aperture of the shell with a calcareous lid. In this state it remains torpid until spring. On the continent of Europe the animal is used as food. By some it is conjectured that this species was introduced into England by Mr Howard about the middle of the sixteenth century. Two varieties of the shell occur; the first has the whorls disjoined and turrited; the second has the whorls sinistral.

56. H. *Pisana.*—Shell white, with interrupted brown bands; peristome, internally, pink coloured.

Mull. Verm. ii. p. 60.—H. zonaria, *Penn.* Brit. Zool. iv. 137. t. 85. f. 133.—H. cingenda, *Mont.* Test. Brit. 418.—H. rhodostoma, *Drap.* Moll. 86.—South of England.

Shell about ¾ths of an inch in breadth, subpellucid, minutely striated, longitudinally and transversely; the last band, with irregular edges, entering the mouth; mouth wide, rounded, peristome rising on the side of the pillar cavity. Animal pale yellow; tentacula dark coloured, with a dusky streak at the base of each, extending backwards on the neck of the animal.

57. H. *subrufescens.*—Shell transparent, horn coloured, without bands.

Miller, Annals of Philosophy, vol. xix. p. 379.—Environs of Bristol.

Shell of 5 whorls, separated by a deep groove; the apex depressed, the edge indistinctly carinated, transversely striated by the lines of growth; mouth rounded externally, narrow near the pillar, where the lip is reflected, in part, over the cavity. In none of the specimens in my possession, which I owe to the kindness of Mr Miller, has the mouth acquired the peristome of maturity. It seems, however, to be a distinct species.

58. H. *albella.*—Shell flat above, with a carinated edge; gibbous beneath.

Cochlea alba, *List.* Conch. t. 80. f. 81.—H. alb. *Linn.* Syst. 1242. *Drap* Moll. 113.—On the shore, St Andrew's.

Shell dusky yellowish-white, minutely striated by the lines of growth. Whorls 3 or 4, the line of separation distinct, but the spire very little raised. Mouth rather wide at the pillar. Draparnaud states, after Muller, that three spires can be seen in the pillar cavity; a mistake, probably arising from the latter contemplating a dead specimen of *Planorbis corneus*, instead of the true *albella.* By the former, that animal is said to frequent rushes on the coast. A single dead specimen of this shell, in my possession, was found in 1810, on the shore at St Andrew's.

59. H. *terrestris.*—Spire conical, whorls flat, carinated at the base.

Trochilus Monspessulanus, *List.* Conch. t. 61. f. 58.—Trochus terrestris, *Penn.* Brit. Zool. iv. 127. *Don.* Brit. Shells, t. iii. *Mont.* Test. Brit. 287.—H. elegans, *Drap.* Moll. 79.—England, rare.

Shell whitish, striated longitudinally; whorls 5 or 6, nearly flat, divided by a very small depressed line, with a prominent ridge at the base of each; apex produced, but not very pointed; mouth compressed, angulated; base flat, striated from the centre.—This species has hitherto been found only in Northamptonshire by Morton, and Cumberland by Hudson.

60. H. *Trochilus.*—Spire conical; whorls rounded.

Buccinum parvum sine Trochilus sylvaticus, *List.* An. Ang. 123.—H. Troch, *Mull.* Verm. ii. 79.—H. trochiformis, *Mont.* Test. Brit. 427. —In moist situations, rare.

Shell thin, pellucid, horn coloured; whorls 6, rounded, and strongly divided by the separating line; apex considerably produced; mouth transverse, narrow; lip a little reflected on the pillar cavity. Montagu has found this species in Wiltshire and Devonshire among decayed wood. A specimen, found in the south of Fife, was presented to me by Mr Chalmers, surgeon, Kirkcaldy.

61. H. *Turtoni.*—Shell flat on both sides, with a rounded margin.

H. rotundata, *Turton*, Conch. Dict. 53.

" Shell quite flat and level on both sides, dark horn coloured, with transverse chesnut marks or blotches, which, however, are not in a regular radiate manner, with the perforation rather large, but not exhibiting the internal volutions; spires 6, rounded and well defined, crossed with regular, close set, fine, rather oblique, raised lines; the larger volution rounded at the margin and without the faint keel-like appearance; aperture large, roundish, crescent shaped, the margin thin and not reflected over the perforation; diameter not a quarter of an inch." Such is the description of a singular species found by Dr Turton in the woods near Brecon. It is not the H. *rotundata* of Muller, though probably a variety of his H. *obvoluta*, Hist. Verm. ii. 27.

** *Preceding whorls in part exposed by the pillar cavity.*

62. H. *ericetorum.*—Whorls six, rounded, subdepressed; mouth suborbicular; pillar cavity very wide.

Cochlea cinerea albidave, fasciata, ericetorum, *List.* An. Ang. 126.—H. ericetorum, *Mutl.* Verm. ii. 33.—H. albella, *Penn.* Brit. Zool. iv. 132. —H. er. *Mont.* Test. Brit. 437.—Sunny banks.

Shell about ¾ths of an inch in breadth; white, or whitish with dark brown bands, or brownish with whitish bands; the upper band of the body whorl seen along the separating line of the preceding ones. Mouth rounded externally, the lips approaching internally. 3 or 4 whorls visible in the pillar cavity. Animal with a pellucid foot, tentacula clavated; body dusky. The shell figured by Lister, Conch. t. 78. f. 78, and so generally referred to this species, is surely widely different.

63. H. *virgata.*—Whorls 6, rounded, a little produced; pillar cavity in part covered by the lip.

Cochlea alba, leviter umbilicata pluribus fasciis circumdata, clavicula productiore, *List.* Conch, t. 59. f. 56.—H. zonaria, var. *a. Penn.* Brit. Zool. iv. 137. t. 85. f. 133. *a.*—H. virg. *Mont.* Test. Brit. 415.—H. variabilis, *Drap.* Moll. 84.—Maritime pastures and dry banks, England and Ireland.

Breadth about half an inch; colour whitish, with brown bands, the upper one on the body whorl continuing along the separating line to the apex. Mouth wide at the pillar margin; peristome brown, with a white thread-like elevation; pillar cavity a little contracted by the lip, exhibiting only one volution. This species is very common on the limestone rocks in the neighbourhood of Cork.

64. H. *cantiana.*—Shell with 6 rounded, wrinkled, volutions, inner lip in part closing the pillar cavity.

Cochlea dilute rufescens, var. *List.* An. Ang. 126. *Mont.* Test. Brit. 422. t. 22. f. 1.—H. pallida, *Don.* Brit. Sh. t. 157. f. 2. 2. Woods and hedges, England and Ireland.

Breadth nearly an inch. Margin rounded with a whitish band; the base of the shell and mouth rufous; the thickened peristome white. One whorl only visible in the pillar cavity.

65. H. *rufescens.*—Shell with 6 rufous, rounded, whorls, subcarinated on the margin, pillar cavity large.

Cochlea dilute rufescens, *List.* An. Ang. 125, Conch. t. 71. lower fig.—H. hispida, *Mull.* Verm. ii. 73.—H. ruf. *Mont.* Test. Brit. 420.—Under stones and moss, common.

Breadth upwards of half an inch; spire little elevated; brown, covered with numerous short hairs; finely striated by the layers of growth; mouth rounded externally, rather narrow at the pillar, where the lip is a little reflected, pillar cavity large, rounded, exhibiting two or three volutions. Animal dusky.

66. H. *hispida.*—Shell thin; pale coloured; whorls five, rounded; pillar cavity with steep sides.

Mont. Test. Brit. 423. t. xxiii. f. 3. *Drap.* Moll. 103.—Among moss in England and Scotland.

Breadth about ¼th of an inch; it is covered with minute short hairs; spire but little raised; aperture lunate, rather contracted in the middle; the lip a little reflected on the cavity, within which, one or two volutions are visible. The shape of the mouth and pillar cavity, and the absence of a subcarina, distinguish this species from the young of *rufuscens*, with which it has very frequently been confounded.

67. H. *aculeata.*—Whorls four, crossed by regular membranaceous ridges, which are produced into hair-like spines about the middle.

Mull. Hist. Verm. ii. 81.—H. spinulosa, *Light.* Phil. Trans. vol. 76. 166. t. 11. lower f. 1, 5. *Mont.* Test. Brit. 426. t. xi. f. 10.—Among moss, not uncommon.

Breadth about the tenth of an inch; whorls brown, thin, rounded, well defined, rather produced ; mouth rounded, the lips white, approaching ; pillar-cavity distinct.

68. H. *nitida.*—Shell depressed, transparent, glossy, greenish, with a tinge of white on the pillar-cavity.

List. Conch. t. 71. upper f. *Mull.* Hist. Verm. ii. 32.—H. lucida, *Mont.* Test. Brit. 425. t. xxiii. f. 4.—Common among moss and under stones.

Breadth nearly half an inch ; whorls five or six, the lower one rounded, the upper ones nearly even, with a deep line of separation ; minutely striated by the lines of growth ; margin of the mouth thin ; pillar-cavity wide, exposing two of the whorls.—The young shells of this species seem to be the *H. nitidula* of *Drap.* Moll. 117, and described by the Rev. R. Sheppard, Linn. Trans. xiv. 160. as occurring in Essex ; and the fry do not seem to differ from the *H. pygmea* of *Drap.* Moll. 114, described by Dr Turton as found in England abundantly in ditches, under leaves,—Zool. Journ. N°. viii. p. 565. The *Helix alliaria* of Miller, Annals of Philosophy, t. xix. is probably also only a variety of this species. He described it as " an umbilicated, depressed, pellucid, shining, horn-coloured shell, having no more than four volutions. This species never arrives to the size of *H. nitens*, has one volution less, and is found under moss on old trees. Its inhabitant smells strongly of garlick." The Rev. Mr Sheppard takes notice of this fetid smell in the animal of *nitida*, which, in some instances, he adds, " is not observable till the shell has been immersed in boiling water." The *H. nitida, hispida*, and *rufescens*, are sometimes found under water.

69. H. *umbilicata.*—Whorls five, rounded ; apex slightly produced ; pillar-cavity large, exposing the whorls to the end.

Mont. Test. Brit. 434. t. xiii. f. 2.—H. rupestris, *Drap.* Moll, 82.—Under stones and moss, in England and Scotland.

Breadth about a tenth of an inch ; brown ; whorls finely and closely striated across, deeply divided by the separating line ; mouth suborbicular, margin thin ; upper tentacula short ; under ones mere tubercles. Before reaching maturity, this species appears to be the *H. Kirbii* of the Rev. R. Sheppard, Linn. Trans. xiv. 162, which differs merely in having four volutions, and being half a line in breadth.

70. H. *crystallina.*—Shell transparent, glossy, of four depressed whorls, the last large.

Mull. Verm. 23.—H. pellucida, *Penn.* Brit. Zool. iv. 138.—H. cryst. *Drap.* Moll. 118.—At the roots of grass, England.

Breadth about $\frac{1}{8}$th of an inch ; whorls smooth, with a deep line of separation, and the spire depressed ; aperture wide, the margin slightly thickened. The specimens in my possession are from Battersea, and were sent to me by Dr Leach.

71. H. *caperata.*—Whorls six, subcarinated, with interrupted brown bands, and deep transverse striæ.

Mont. Test. Brit. 430. t. xi. f. 11.—H. striata, *Drap.* Moll. 106.—In dry situations.

Breadth about half an inch; convex on both sides; a broad brown band above the keel, and another below it; the keel itself white; the brown bands are mottled with white; aperture rounded, thin on the margin, with a white raised band within; pillar-cavity exposing the preceding whorl.—This species is probably the *H. maculata* of Muller.

72. H. *rotundata.* — Whorls six, depressed, subcarinated, strongly striated across, with a very wide pillar-cavity.

C. terrestris, compressa, maculata et leviter striata, *List.* Conch. t. 1058. f. 11.—H. rot. *Mull.* Verm. ii. 29.—H. radiata, *Mont.* Test. Brit. 432. t. xxiv. f. 3.—H. rot. *Drap.* Moll. 114.—Common under leaves and stones.

Breadth about ¼th of an inch; radiated above with brown lines; whorls strongly divided by the separating line; aperture transverse; pillar-cavity exposing the previous whorls.

73. H. *costata.*—Whorls four, rounded; the peristome thick, suborbicular.

H. cost. et pulchella, *Mull.* Verm. ii. 31.—Turbo helicinus, *Light.* Phil. Trans. vol. lxxvi. 167. t. iii. f. 1, 4.—H. paludosa, *Walk.* Test. Min. t. i. 23.—H. pal. and crenella, *Mont.* Test. Brit. 404.—Under damp moss, common.

Breadth about $\frac{1}{10}$th of an inch; whorls covered with a brown epidermis, raised into numerous transverse ridges; colour of the shell white, slightly striated transversely; margins of the aperture nearly uniting on the body-whorl; pillar-cavity exposing the inner volutions.

74. H. *elegans.*—Shell with seven rounded produced volutions.

Brown, Wern. Mem. ii. 528. tab. xxiv. f. 9.—H. disjuncta, Turton, Conch. 61. t. xvi. f. 63.—Near Dublin. Mr Stephens.

" Shell subpellucid, somewhat glossy, with seven ventricose and very deeply divided volutions, tapering to rather an obtuse apex; the first or body-whorl is much inflated; a white band runs spirally from the base to the apex, giving it a strong appearance of being carinated, and the volutions are slightly wrinkled across. It is furnished with a deep and wide umbilicus, which, viewed directly from the base, is partly hid by the reflected lip of the shell; aperture subrotund, lip very thin, and reflected on the columella. The colour is of a dirty white, with several interrupted dark umber-coloured bands, which run spirally from the base to the apex; length ⅝ths of an inch; breadth 3½eighths," *Brown.*—This is probably only a monstrous variety of some of the more common species.

b. *Without a pillar-cavity. Globose.*

75. H. *aspersa.*—Shell brown, with white transverse stripes; mouth subascending.

Cochlea vulgaris, *List.* An. Ang. 113. Conch. t. xlix. 47.—H. aspersa, *Mull.* Verm. ii. 59.—H. hortensis, *Penn.* Brit. Zool. iv. 136.—H. asp. *Mont.* Test. Brit. 408.—Gardens and old walls, common.

Breadth about 1½ inch, with four whorls, slightly striated and wrinkled across; mouth elongated upwards, margin white, thickened, a little reflected.

76. H. *arbustorum.*—Shell mottled with a single brown longitudinal band.

Cochlea maculata, *List.* An. Ang. 119. Conch. t. lvi. f. 53.—H. arb. *Mull.* Verm. ii. 55. *Penn.* Brit. Zool. iv. 136. *Mont.* Test. Brit. 413. —In boggy places, common.

Breadth scarcely an inch; whorls slightly striated longitudinally, and wrinkled transversely; mouth obliquely transverse, rounded; margin white, thick, reflected.

77. H. *nemoralis.*—Peristome brown; margin next the pillar nearly straight.

Cochlea citrina, *List.* An. Ang. 116. Conch. t. lvii. f. 54.—H. nem. *Mull.* Verm. ii. 46. *Penn.* Brit. Zool. iv. 137. *Mont.* Test. Brit. 411.—Shady places, common.

Breadth about an inch; whorls five, wrinkled across. Colour yellowish, without bands, with a single band, or with several bands. These varieties are considered by the Reverend Revitt Sheppard as distinct species, because they do not unite indiscriminately in the season of love; and he adds, "from the *one-banded* and *many-banded* sorts I have taken the *spicula* or *love-darts;* that of the former is four-sided in the middle, and perfectly *straight;* in the latter it is also four-sided in the middle, but curved as in *H. aspersa.*"

78. H. *hortensis.*—Margin of the mouth invariably white; even near the pillar.

Cochlea citrina, No. 1. *List* An. Ang. 117.—H. hort. *Mull.* Verm. 52. *Mont.* Test. Brit. 412.—Not common.

This species closely resembles the preceding, of which it is considered by many as only a variety. It is smaller in size, and less common.

79. H. *fusca.*—Shell thin, pellucid, horn-coloured, with five or six whorls.

Mont. Test. Brit. 424. t. xiii. f. 1.—In England and Ireland, not uncommon.

Breadth less than half an inch; smooth; mouth lunated, narrow near the pillar, thin, not reflected; whorls rounded, the last large. This seems to be the *H. fulva* of Muller, No. 249.—A variety of a white colour, glossy, and pellucid, was sent to Montagu from Scotland by Mr Boyes.

EXTINCT SPECIES.

1. H. *carinata.*—Spire short, conoidal, of three or four turns; a raised, flat, ribband-like projection passes from the lateral edge of the mouth along the middle of the last turn, till it meets the inner edge of the mouth, whence it continues between the volutions to the end. Umbilicus open.—*Sower.* Min. Conch. t. x. upper and lower figures.—In *Carboniferous Limestone*, Settle, Yorkshire.

2. *H. Gentii.*—Discoid, gibbose, smooth, with a spiral band along the upper part of the whorl; aperture large, expanded, elliptical.—*Sower.* Min. Conch. t. cxlv.—*Green Sand* near Devizes.

3. H. *globosa.*—Globose, slightly elongated, obscurely transversely striated; whorls but gradually increasing in size; outer-lip reflected.—*Sower.* Min. Conch. t. clxx. *Crag Fresh water* Limestone, Isle of Wight.

4. H. *striata.* — Conical, depressed, subcarinated, obliquely striated, a rising band around the edge, crossed by arched striæ; columella solid, aperture subtriangular.—*Sower.* Min. Conch. t. clxxi. f. 1.—*Carboniferous Limestone*, Derbyshire.

5. H. *cirriformis.*—Conical, acute, umbilicate, decussato-striated; with a band around the middle of the whorl, crossed with arched striæ; aperture nearly round.—*Sower.* Min. Conch. t. clxxi. f. 2.—In *Carboniferous Limestone*, Derbyshire.

6. H. *lævis.*—Whorls three; surface smooth; spire elevated.—*Mantell*, Geol. Suss. 263. t. xviii. f. 19, 20.—In *Plastic Clay*, Bath.

7. H. *pusilla.*—Depressed, smooth, umbilicated, convex beneath. Volutions round and tapering; their number about three. Mouth roundish.—*Mart.* Pet. Derb. t. lii. f. 3.—In a fossil pericarp, in *Clay Ironstone*, Derbyshire.

Gen. XIX. BULIMUS.—Aperture of the shell longer than broad, the margin near the pillar entire.

80. B. *acutus.* — Whorls nine, rounded, white, with transverse interrupted brown stripes.

> Buccinum exiguum fasciatum et radiatum, *List.* Conch. t. xix. f. 14.—Helix acuta, *Mull.* Verm. ii. 100.—Turbo fasciatus, *Penn.* Brit. Zool. iv. 131. *Mont.* Test. Brit. 346.—Bul. acutus, *Drap.* Moll. 77.—On dry banks near the sea.

Length $\frac{3}{4}$ths of an inch; whorls strongly wrinkled across, sometimes a single or double longitudinal brown band on the lower side of the body-whorl. Margin of the mouth a little reflected on the small pillar-cavity.—Animal pale yellow.

81. B. *obscurus.*—Shell brown, oblong, subcylindrical in the middle, with a blunt spire; outer-lip of the mouth nearly straight.

> Buccinum rupium majusculum circiter senis orbibus circumvolutum, *List.* An. Ang. 122.—Helix obscura, *Mull.* Verm. ii. 103.—Turbo sex anfractibus striatis apertura subrotunda marginata, *Walk.* Test. Min. Rar. t. ii. f. 41. *Mont.* Test. Brit. 391.—B. obs. *Drap.* Moll. 74.—Moist woods and rocks.

Length $\frac{3}{8}$ths of an inch; breadth about one-third of its length: whorls from five to seven, with faint lines of growth, slightly rounded, ending in a blunt knob; pillar-lip nearly perpendicular, a little reflected on the pillar-cavity; peristome white.

82. B. *Lackhamensis.*—Shell brown, oblong, subcylindrical in the middle, with a blunt spire; outer-lip rounded.

> Helix Lack. *Mont.* Test. Brit. 394.—Bul. montanus, *Drap.* Moll. 74.—In woods, England.

Length $\frac{5}{8}$ths of an inch; breadth one-fourth of the length. Similar in other respects to the *B. obscurus* except size, the lines of growth stronger, and the outer edge of the mouth a little more rounded. Judging from an authentic specimen sent to me by the late Mr Montagu, it seems to be only a large variety of the preceding species.

83. B. *lubricus.*—Shell glossy, horn-coloured, bluntly tapering; mouth, externally, narrow.

Buccinum exiguum, quinque anfractum, mucrone acuto, *List.* An. Ang. 122.—Helix lubrica, *Mull.* Verm. ii. 104. *Mont.* Test. Brit. 390.—Bul. lub. *Drap.* Moll. 75.—In moist woods, common.

Lenth $\frac{1}{4}$th inch ; breadth one-third of its length ; whorls five or six, nearly smooth. Mouth a little oblique, margin white, or with a rosy tinge.

84. B. *tuberculatus.*—Mouth with a single tubercle on the body-whorl, near the outer angle.

Turton, Zool. Journ. No. vii. 363. t. xiii. f. 4.—Pershore, Worcestershire.

Length $\frac{1}{2}$ an inch ; breadth $\frac{3}{10}$ths. Shell oval, oblong, with six whorls, rather flat, of a whitish colour ; the lower half of the body-whorl, as well as the slightly reflected peristome, milk-white ; a small pillar-cavity.

* *Naturalized Species.*

1. B. *Goodallii.*—" A subperforated, turrited, pellucid, pale, corneous or almost white shell, having from six to seven volutions, and an ovate aperture."

" Helix Goodalli," *Miller*, Ann. Phil. xix. 381.—Pine-beds, Bristol.

Length upwards of $\frac{3}{10}$ths of an inch ; the whorls rather flat, sometimes eight in number ; separating line distinct ; finely striated across by waved lines of growth. This is the *Cochlicella clavulus* of Ferrussac. We are indebted to Mr Miller for publishing a notice of this curious species. Mr Thomas Drummond, in a letter now before me, says, " The *Helix Goodallii* was first pointed out by me in 1816, when I was in the habit of feeding them, and when I wanted a supply, I merely placed a flat board upon the surface of the tan, and left two or three small worms beneath it (dead ones of course), and I never saw it fail of being covered with them in a few days."

2. B. *decollatus.*—Shell subcylindrical, truncated at the apex.

Buccinum album clavicula productiore fere abrupta, *List.* Conch. t. xvii. f. 12.—Bul. decoll. *Drap.* Moll. 76.

Dr Turton gives the following notice respecting this species : " *Bulimus decollatus* was observed to breed in great abundance, for many successive years, in the green-house at Watton, in the south of Devon, the seat of H. Studdy, Esq., lodged in the earth, under the wood-work, whence they wandered abroad in the summer. This wood-work and the earth were removed, and replaced with stone, by which the colony was lost ; and all that were preserved we owe to the care of Mrs Griffiths and Miss Hill."—Zool. Journ. No. viii. 565.

EXTINCT SPECIES.

1. B. *ellipticus.*—Elliptical, elongated, rather obtuse, longitudinally ribbed ; ribs numerous, very small, straight ; aperture small, twice as long as wide, upon the left side.—*Sower.* Min. t. 337.—Fresh-water Formation, Isle of Wight.

2. B. *costillatus.*—Ovate, rather acute, longitudinally costated ; costæ small, numerous ; aperture elongated, acute above.—*Sower.* Min. Conch. t. 366.—Fresh-water Formation, Isle of Wight.

Gen. XX. ACHATINA. — Aperture of the shell longer than broad; the lip at the pillar truncated.

85. A. *acicula*.—Shell slender, tapering, the last whorl nearly as long as all the preceding ones.

Buccinum acicula, *Mill.* Verm. ii. 150.—B. turritum quinque anfractibus apertura ovali, *Walk.* Test. Min. t. 11. f. 60.—B. terrestre, *Mont.* Test. Brit. 248. t. viii. f. 3.—At the roots of grass and moss, England.

Length $\frac{1}{4}$th of an inch; whorls six, white, glossy, rather flat; separating line distinct; mouth, with the outer lip thin, nearly even, ending at the pillar in a short gutter; inner-lip at the extremity of the pillar subrecurved.

The *Achatina octona;* the *Buccinum tenue album octo minimum orbium* o List. Conch. t. xx. f. 15.; the *Helix octona* of Dr Maton and Mr Rackett, Linn. Trans. vol. viii. t. v. f. 10., has been hastily considered as referred to by Dr Pultney, under the title of *Helix octona*, Dorset, Cat. p. 49. This is an extra European species, and the shell of Dr Pultney is probably only the *Lymnea octona*.

Gen. XXI. SUCCINEA.—Shell with a short pointed spire; mouth longer than broad.

86. S. *putris*.—Shell oblong, of three whorls, with a yellowish tinge.

Buccinum subflavum pellucidum trium spirarum, *List.* An. Ang. 141. t. ii f. 24.; Conch. t. 123. f. 23.—Helix putris, *Linn.* Syst. i. 1249. —H. succinea, *Mull.* Verm. ii. 97.—H. putris, *Mont.* Test. Brit. 376. t. xvi. f. 4.—Among subaquatic plants, common.

Length about $\frac{3}{4}$ths of an inch, of a yellow or green tinge, finely striated by the layers of growth. Body-whorl very large, the other small, pointed; aperture very wide in front, thin. Animal cinereous; the longest tentacula contracted in the fore part. A variety of the shell sometimes occurs with a thickened, expanded subreflected white lip.

Gen. XXII. VITRINA. — Shell with a depressed spire; mouth transverse.

87. V. *pellucida*.—Whorls three, glossy, transparent.

Helix pellucida, *Mull.* Verm. ii. 15.—Vitrina pellucida, *Drap.* Moll. 119. —Hel. elliptica, *Brown*, Wern. Mem. ii. 525. t. xxiv. f. 8.—Vit. pell. *Flem.* Phil. Zool. ii. 459. t. iv. f. 1.—Common among moss and grass.

Breadth nearly $\frac{2}{10}$ths; mouth rounded, the lip thin, slightly reflected at the small pillar cavity. The margin of the shield of the animal is double; the upper fold divided into several lobes, which are capable of being reflected over the shell. In 1809, I sent this shell from Zetland, to the late Mr Montagu, who considered it as the fry of the *Helix nitida*.

GEN. XXIII. PUPA.—Tentacula four, aperture of the shell rounded, in the direction of the axis.

a. *Aperture of the shell toothed.*

* *Teeth confined to the pillar lip.*

88. P. *muscorum.*—Whorls six, the three last subcylindrical; the margin of the mouth broad, reflected.

Buccinum exiguum subflavum, mucrone obtuso, sive cylindraceum, *List.* An. Ang. 121.—Turbo muscorum, *Linn.* Syst. i. 1240. *Mont.* Test. Brit. 335.—P. musc. *Drap.* Moll. 59.—Among moss, common.

Length about $\frac{1}{8}$th of an inch; whorls six, increasing rather rapidly from the apex to the fourth; separating line distinct; finely striated across; of a horn colour. Mouth with the margin white; a single tooth on the pillar, even with the outer lip, and near the inflected junction of the outer lip with the body-whorl: pillar-cavity, behind, wide, the sides steep.

89. P. *marginata.*—Whorls six, the three last cylindrical; the margin of the mouth narrow, reflected.

Drap. Moll. 61.—Turbo Chrysalis, *Turt.* Conch. Dict. 220.—P. marg. *Sheppard*, Linn. Trans. xiv. 154.—Not uncommon, under stones and among grass, England.

Length about $\frac{1}{8}$th of an inch; the whorls increasing rapidly from the apex to the third; separating line distinct; finely striated across; of a brownish horn colour: margin of the mouth white; a single tooth on the pillar, a little within, and nearly in the middle; pillar-cavity, behind, small. This species was sent me many years ago, by Dr Leach, from Battersea, under the title *Pupilla marginata.*—Mr Sheppard states, that it is common in Suffolk and Essex.

** *Teeth on both lips.*

90. P. *juniperi.*—Whorls nine; mouth with three teeth on the outer lip, and four on the pillar.

Turbo jun. *Mont.* Test. Brit.—Pupa avena. *Drap.* Moll. 54.—Among moss and juniper-bushes, England.

Length about $\frac{1}{4}$th of an inch, opake brown; whorls, increasing gradually from the apex to the fourth, and then continuing nearly cylindrical, rounded; separating line distinct; obliquely striated across; peristome white, reflected; pillar-cavity, behind, small.

91. P. *sexdentata.*—Whorls five; mouth with six or seven teeth; three of which are on the body lip.

Turbo sexdentatus, *Mont.* Test. Brit. 337.—P. antivertigo, *Drap.* Moll. 60. Turbo sex. *Sheppard*, Linn. Trans. xiv. 156.—At the roots of grass.

Length about a line; of a brown colour; whorls increase progressively in size; aperture suborbicular; the outer lip slightly inflected in the middle.

92. P. *pygmæa.*—Whorls five; mouth with four teeth, one of which is on the body-lip.

Drap. Moll. 60.—Among moss, frequent.

Length about $\frac{1}{10}$th of an inch; brown; whorls increase progressively; peristome a little reflected; outer lip with two teeth, and a third at the anteal junction with the pillar. This species was confounded with the preceding, by the late Mr Montagu, as appears from his having sent me, on two different occasions, specimens of *P. pygmæa* for *P. sexdentata.*—It is not a rare shell.

b. *Aperture of the shell destitute of teeth.*

93. E. *edentula.*—Shell obtusely conical, of five or six whorls; peristome simple.

Drap. Moll. 59.—Turbo Oftonensis, *Sheppard*, Linn. Trans. xiv. 155.—Among grass in woods, England.

Length about a line, brown, pellucid, glossy, finely striated across. In 1822, Mr Miller sent me specimens of this shell from Bristol, and afterwards informed me of his possessing a variety having six volutions, with the lip slightly reflected, and a very minute tooth on the pillar.—In the shell referred to by Mr Sheppard, the whorls are seven in number.

94. P. *obtusa.*—Shell nearly cylindrical; peristome thickened.

Drap. Moll. 63.—Among moss near old walls.

A shell corresponding with this species, except in size and the number of whorls, was sent me in 1813, by Mr Chalmers, surgeon, Kirkaldy, who found it in the parish of Balmerino, Fifeshire. It is not a line in length, while Draparnaud's shell is about half an inch; this has only five whorls, his has eight. The whorls increase suddenly to the third, and then continue nearly of the same size: they are rounded with a deep separating line; aperture a little longer than broad; the outer lip inclining to straight, and anteally where it joins the pillar, it is a little reflected, so as to form a minute pillar-cavity.

GEN. XXIV. AZECA.—Aperture of the shell oblique, narrow retrally.

95. A. *tridens.*—Whorls six or seven, slightly raised; form ovate.

Turbo tridens, *Pult.* Dorset. 46. *Mont.* test. Brit. 338. t. xi. f. 2. *Sheppard*, Linn. Trans. xiv. 154.—In England and Scotland, rare.

Length upwards of ¼th of an inch; brown, translucent, glossy, with distinct striæ. The aperture is rounded at the pillar, becoming very narrow and gutter-like at the junction of the body-whorl; this last circumstance produces the appearance of a dark band along the somewhat indistinct separating line; outer-lip with one tooth, inner-lip with two long and two short teeth; peristome entire, no pillar-cavity. This species was first observed by Dr Pultney, in Dorsetshire, and subsequently by different observers in other places. It is not the *Helix tridens* of Muller, or the *Pupa tridens* of Draparnaud. It was sent to me by Dr Leach, under the name of *Azeca Maloni.* The generic name I have adopted, but the specific one has been rejected as an unnecessary change.—Its true place will probably be found in the following genus.

GEN. XXV. CARYCHIUM.—Tentacula two, eyes at the base behind, aperture oblique.

96. C. *minimum.*—Whorls five or six, rounded, smooth, glossy.

Mull. Verm. 125.—Turbo, *Walk.* Test. Min. t. ii. f. 51.—T. Car. *Mont.* Test. Brit. 339.—Auricula minima, *Drap.* Moll. 57.—Among moss, common.

Length about a line, of a pale white colour, the lines of growth very minute. Aperture slightly contracted retrally; outer-lip with one tooth, the inner-lip at the pillar with two teeth. Peristome thickened, reflected.—Lamarck substituted *Auricula* in place of *Carychium*, a change in which he has been followed, of course, by his countrymen.

97. C. *fuscum.*—Whorls six, the lines of growth distinct, the mouth without teeth.

Turbo quinque anfractibus striatis apertura subovali, *Walk.* Test. Min. t. ii. f. 42.—T. fuscus *Mont.* Test. Brit. 330.—Auricula lineata, *Drap.* Moll. 57.—Bulimns lineatus, *Turton*, Zool. Journ. No. viii. 565.—England.

Length about ⅛th of an inch, glossy, brownish; separating line distinct, marginated; aperture rounded anteally, narrow retrally; peristome slightly thickened, white. Tentacula long, between which and the eyes behind are two jagged spots. This species was first observed at Bysing Wood, near Faversham, by Walker. Mr Miller, in 1822, informed me that General Bingham had found it about eleven miles from Bristol, and Dr Turton observes, that "it is found abundantly in wet springy places in various parts of Devonshire, imbedded among the *Jungermanniæ*, constantly exposed to the drippings of springs.—A variety is also found of a pale yellowish colour."

* * *

EXTINCT SPECIES.

1. C. *incrassata.*—Ovate, ventricose, transversely sulcated, longitudinally striated; spine short; mouth angular above, with very thick lips; columella three-plaited.—Auricula ringens, *Park*, Org. Rem. iii. 84. t. v. f. 4.—A. incrassata, *Sower.* Min. Conch. t. clxiii. f. 1–3.—*Green Sand*, Blackdown.

2. C. *turgida.*—Ovate acute, turgid, transversely striated, shining; spire short, acute; aperture oblong, with thickened lips; columella two-plaited; outer-lip smooth within; thickest in the middle.—Auricula turgida, *Sower.* Min. Conch. t. clxiii. f. 4.—*London Clay*, Highgate.

3. C. *simulata.*—Oval, pointed with transverse laterally toothed costa; whorls slightly ventricose; mouth angular above; outer-lip sharp, striated within; two broad plaits upon the columella. (Bulla sim. Brander, 61.) *Sower.* Min. Conch. t. clxiii. f. 5–8.—*London Clay.*

4. C. *pyramidalis.*—Ovate, pointed, smooth; spine pyramidal; volutions rounded above, the last subcylindrical, short; aperture half the length of the shell, with a sharp outer-lip, and two plaits upon the columella.—*Sower.* Min. Conch. t. ccclxxix.—In Crag. It is probable that these three fossil species are marine, and belong to a different genus.

GEN. XXVI. BALEA.—Tentacula four; pillar simple.

98. B. *perversa.*—Whorls eight or nine, tapering, rounded.

Buccinum alterum pellucidum subflavum, *List.* An. Ang. 124.—Turbo perversus, *Mont.* Test. Brit. 355. t. xi. f. 12.—Pupa fragilis, *Drap.* Moll. 68.—In moss at the roots of trees.

Length nearly half an inch, translucent, with minute sharp lines of growth; apex blunt; whorls tapering regularly; mouth rounded anteally, becoming narrow at the retral external angle; peristome thin on the body, with one tooth, slightly reflected at the pillar, forming behind a small cavity. According to Lister, the individuals pair in March, a smaller with a larger.—This genus, instituted by Mr Prideaux, has been described by Mr Gray, Zool. Journ. No. i. 61.

GEN. XXVII. CLAUSILIA.—Tentacula four; pillar with an attached pedunculated testaceous scale, for closing the aperture.

99. C. *bidens.*—Whorls eleven, smooth, glossy; the pillar-scale emarginate.

Buccinum exiguum, *List.* Conch. t. xli. large fig.—Helix bidens, *Mull.* Verm. 116.—Turbo bidens, *Penn.* Brit. Zool. iv. 131.—T. laminatus, *Mont.* Test. Brit. 359. t. xi. f. 4.—Cl. bidens, *Drap.* Moll. 68.—England.

Length about ¾ths of an inch; whorls slightly rounded, and well defined by the separating line; aperture rounded, subquadrangular; peristome adhering to the body, slightly reflected at the pillar; two conspicuous teeth or folds on the body, lip, and three others, concealed within the aperture.

100. C. *perversa.*—Whorls twelve, striated, aperture entire, rounded; pillar-scale entire.

Buccinum pullum opacum ore compresso circiter denis spiris fastigiatum, *List.* An. Ang. 123. Conch. t. xli. f. 39.—Helix perversa, *Mull.* Verm. 118.—Turbo bidens, *Mont.* Test. Brit. 357.—Clausilla rugosa, *Drap.* Moll. 73.—Turbo nigricans, *Maton* and *Rackett*, Linn. Trans. viii. 180.—In walls and trees, common.

Length about half an inch, somewhat swollen in the middle, of a brown colour. Whorls rounded at first, becoming more flat towards the mouth; lines of growth distinct; aperture detached from the body-whorl, rounded anteally, narrow retrally, with a ridge on the body-whorl behind; peristome white, reflected, with two teeth on the pillar-lip; pillar-scale entire.—Judging from specimens obligingly sent me by Mr Millar, I am inclined to consider his *Turbo Everetti* (Annals of Phil. xix. 377.) as belonging to this species.

101. C. *biplicata.*—Whorls twelve or thirteen, aperture entire, compressed; pillar-scale entire.

Turbo bip. *Mont.* Test. Brit. 316. t. ii. f. 5.—In Wiltshire.

Length about ¾ths of an inch, brown, with distinct lines of growth; whorls slightly rounded; aperture narrow at both ends; peristome entire, detached, slightly reflected, with two approaching teeth on the body-lip. This species, specimens of which were sent me by Mr Montagu, does not seem to correspond with any of those described by Draparnaud.—The *Helix papillaris* of

Muller (Verm. 120.), to which Montagu refers his species with doubt, is more probably the *T. bidens* of Dr Pultney (Dorset, 46.), which he describes as having the "sutures of the volutions elegantly crenated," and which Maton and Rackett (Linn. Trans. viii. 178. t. v. f. 3.) consider as the *Turbo bidens* of Linnæus, but a species not of British growth.

102. C. *plicatula.*—Aperture with five or six teeth on the body-lip.

Drap. Moll. 72.—C. Rolphii of Leach, *Turt.* on Zool. Journ. No. viii. 565.—England.

Length about half an inch, swollen in the middle; whorls ten or more, rounded towards the apex; lines of growth well marked, those near the aperture wrinkled; aperture subquadrangular, contracted on the outer retral angle. The teeth vary in number, one at the end of the range large, the intermediate ones small. Examples of this shell were sent me by Dr Leach, as a new species, from Charleston Woods, Kent. I agree, however, with Dr Turton, in referring it to the *C. plicatula* of Draparnaud, although the figure given in his work, expresses less perfectly the shape of the British shell than the one which represents *C. bidens.*—Dr Turton, when noticing this shell, adds, "At Torquay we found a perfectly formed specimen of the *C. parvula*, mentioned by Dr Leach. It is much less and more slender than *C. rugosa* of Draparnaud, and is very faintly striate or smooth, except on the lower volution. The two possessed by the Provost of Eton, are no doubt the same. The aperture resembles that of *C. rugosa.*"

103. C. *labiata.*—Whorls nine, flat; the lines of growth strong, continuous.

T. labiata, *Mont.* Test. Brit. t. 362. t. xi. f. 6.—On trees near London, Mr Swainson.

Length $\frac{5}{8}$ths of an inch, lengthened, light brown, opake; separating line obsolete, not interrupting the striæ; aperture suborbicular, contracted retrally; pillar-lip with two teeth; peristome broad, thick, white, nearly free, reflected.—This shell, which has escaped the notice of more recent collectors, is probably only a variety of *C. perversa*, which exhibits considerable modifications of growth.

Gen. XXVIII. VERTIGO.—Tentacula two, with eyes at the tips; pillar simple.

104. V. *pusilla.*—Whorls five; aperture with teeth on both sides.

Mull. Verm. 124.—Turbo vertigo, *Mont.* Test. Brit. 363. t. xii. f. 6.—Pupa vertigo, *Drap.* Moll. 61.—Ivy-walls, England.

Length about half a line, bluntly conical; whorls rounded, with distinct lines of growth; aperture subtriangular, the base or lip on the body-whorl has two conspicuous teeth; the pillar-lip has one near its retral extremity; the outer-lip has likewise one; besides these there are sometimes two or three smaller intermediate teeth; perisome reflected at the pillar, forming a distinct cavity.

AQUATICA.

Tentacula two, usually flat, with eyes at the base. Respire at the surface of the water. Sexes united; spawn deposited under water on aquatic plants. PHYTIVOROUS.

- *a.* Shell spiral.
  - *b.* Shell turrited.
    - *c.* Whorls dextral.
      - Limnea.
      - *Assiminia.*
    - *cc.* Whorls sinistral.
      - Physa.
      - Aplexa.
  - *bb.* Shell discoid. Tentacula filiform.
    - Planorbis.
    - Segmentina.
- *aa.* Shell simple, conical.
  - Ancylus.

GEN. XXIX. LIMNEA.—Aperture of the shell longitudinal; the outer lip, in bending in on the pillar, forming an oblique entering fold. Tentacula lanceolate.

* *Shell turrited.*

105. *L. stagnalis.*—Whorls six or seven; the last large in proportion.

Bucc. longum 6 spirarum, *List.* An. Ang. 137. Conch. Tab. 123, f. 21.—B. stag. *Mull.* Verm. ii. 132.—Helix stag. *Penn.* Brit. Zool. iv. 138, tab. lxxxvi. f. 136. *Mont.* Test. Brit. 367.—In lakes and stagnant waters.

Length nearly 2 inches; brownish, translucent; lines of growth distinct, with numerous longitudinal wrinkles; the upper whorls smooth; the separating line distinct. Lister mentions having seen a variety with branched tentacula.

106. *L. fragilis.*—Whorls six, diaphanous; upper whorls with a shallow oblique separating line.

Helix fragilis, *Mont.* Test. Brit. 369, tab. xvi. f. 7.—In canals in England and Ireland.

This species is less than the preceding; the aperture is narrower; the spires increase more gradually, and the first formed ones are less rounded. It was observed by Montagu, in the Kennet and Avon Canal, Wiltshire. It likewise occurs in the Grand Canal near Dublin. The specimens I possess were sent to me by Dr Leach, from the Croydon Canal.

107. *L. detrita.*—Shell thick, obtusely conical, of six whorls, with a brown band along the line of separation.

Helix detrita, *Pult.* Dorst. 49. *Mont.* Test. Brit. 384, tab. xi. f. 1.—In England and Ireland.

Length ¾ths of an inch; lines of growth numerous, fine, with minute longitudinal striæ, sometimes plain or with one, two, or three brown bands; whorls nearly flat; aperture narrow; pillar-lip reflected, forming a distinct cavity behind. Mr Bryer found this shell in a pool near Weymouth, and in a stream near Dorchester. Dr Turton adds, that it is found at Dublin. Judging from English and foreign specimens sent to me by the late Rev. James Lambert *senior*, Fellow of Trinity College, Cambridge, I am inclined to consider the *Helix detrita* of Pultney, and the *Bulimus radiatus* of Drapernaud, as distinct species, the latter being a land shell.

108. *L. palustris.*—Shell brown; whorls six, tapering to a sharp point.

Bucc. minus fuscum, *List.* An. Ang. 139. Conch. tab. 124. f. 24.—H. stagnalis, var. B., *Penn.* Brit. Zool. iv. 139.—H. pal. *Mont.* Test. Brit. 370, tab. xvi. f. 10.—H. fragilis et fontinalis, *Don.* Brit. Shells, tab. 175, f. 1, 2.—In ditches and swamps. Common.

Length about ¾ths of an inch, with numerous lines of growth, and longitudinal wrinkles; whorls rounded; peristome thickened, purplish.

109. *L. octona.*—Whorls eight; shell subcylindrical, pointed.

Helix octona, *Linn.* Syst. i. 1248.—Bucc. glabrum, *Mull.* Verm. ii. 135. H. oct. *Penn.* Brit. Zool. iv. 138, tab. lxxxvi. f. 135. *Pult.* Dorst. 49.—H. octanfracta, *Mont.* Test. Brit. 396, tab. xi. f. 8.—L. elongatus, *Drap.* Moll. 53.—In slow running ditches.

Length ⅝ths, breadth of the body-whorl about ⅛th of an inch; yellowish-brown; whorls rather flat, striated across; mouth narrow; fold on the pillar elevated. Animal dusky; foot short; tentacula narrow, flat; eyes at the internal base, in a shallow cavity, covered by a small protuberance, resembling the rudiments of tentacula. This seems a very local species. Montagu found it in Cornwall; and it has occurred to me in several ditches in the upper part of Linlithgowshire. The *Physa scaturiginum* of Drapernaud, (Moll. 56), and named as British by Dr Turton (Zool. Journ. N°. VIII. 565.) seems to be only the young of this species.

110. *L. fossaria.*—Whorls five, rounded; pillar-lip broad, reflected.

H. foss. *Mont.* Test. Brit. 372, tab. xvi. f. 9.—In shallow muddy pools. Common.

Length ⅜ths of an inch; whorls increasing more rapidly than in the preceding; striated across, and wrinkled longitudinally; separating line deep; mouth wide; lip, in descending on the pillar, broad and reflected, exhibiting the oblique fold very indistinctly.—This is probably the Turbo striatus quatuor anfractibus apertura ovali marginata of *Walker*, Test. Min. tab. ii. f. 57, called T. rivulus, by *Montagu*, and Limnea minuta by *Drap.* Moll. 53.—This species and the L. octona frequently creep out of the water, and remain for some time in a quiescent state.

** *Shell ventricose.*

111. *L. limosa.*—Whorls five; the first four rounded; mouth slightly contracted.

H. lim. *Linn.* Syst. i. 1249.—Bucc. peregrum, *Mull.* Verm. ii. 130.—H. putris, *Penn.* Brit. Zool. iv. 139, tab. lxxxvi. f. 137.—H. peregra, *Mont.* Test. Brit. 373, tab. xvi. f. 3.—L. ovatus, *Drap.* Moll. 50.—In ponds and rivers. Common.

Length seldom exceeding an inch; translucent, with minute lines of growth, and longitudinal wrinkles.—This shell, every where abundant, exhibits considerable differences in its mode of growth and forms, according to the places it inhabits, and has given rise to the construction of many spurious species.

112. *L. auricularia.*—Whorls four, the three first minute, flat pointed.

Buccinum pellucidum, subflavum, quatuor spirarum, mucrone acutissimo, testæ apertura omnium maxima, *List.* An. Ang. 139. Conch. tab. 123, f. 22.—H. auricula, *Linn.* Syst. i. 1250. *Penn.* Brit. Zool. iv. 138. *Mont.* Test. Brit. 375, tab. xvi. f. 2.—In stagnant pools. England.

Length about an inch, thin, subpellucid, striated across, and wrinkled longitudinally; mouth wide; the outer lip semicircular.—This species is often confounded with the preceding, from which it differs in the apex being more pointed, the three first spires more minute, and the outer lip more expanded.

113. *L. glutinosa.*—Whorls three; the two first minute, the last ventricose, and diaphanous.

Bucc. glut. *Mull.* Verm. ii. 126.—Helix glut. *Mont.* Test. Brit. 379, tab. xvi. f. 5.—In ponds. England.

Length about half an inch, thin, fragile, glossy, nearly smooth; aperture oval, without the fold on the pillar-lip. Animal large in proportion to its shell; of a yellow colour.

114. *L. lutea.*—Whorls scarcely three; the last large in proportion; pillar-lip spreading.

H. lutea, *Mont.* Test. Brit. 380, tab. xvi. f. 6. *Turt.* Conch. Dict. 69. *Shepp.* Linn. Trans. xiv. 169. England.

Length half an inch, suboval, subpellucid, yellow, smooth, apex obtuse, aperture patulous, oval.—The two authors first quoted seem to consider this as a sea-shell; while the last states that he has taken it in abundance at Winthorpe, on the banks of the Trent, after a flood, and at least thirty miles above its junction with the salt-water. He adds, " it probably inhabits the depths of rivers."

115. ASSIMINEA *Grayana.*—Dr Leach sent me, several years ago, a shell, from Greenwich marshes, constituting " a new fresh water genus," under the title ASSIMINEA *Grayana.* The lip is thickened on the pillar, and reflected over the cavity, but is destitute of the oblique fold; and the lip does not extend over the body-whorl. The colour is brown; the whorls six in number, conical, regularly increasing in size, glossy, with minute lines of growth. Length about $\frac{2}{10}$ths of an inch.

EXTINCT SPECIES.

1. *L. fusiformis.*—Subfusiform, smooth; sides of the spire nearly straight; aperture narrow, half the length of the shell, *Sower.* Min. Conch. tab. 169, f. 2, 3.—Fresh water formation, Isle of Wight.

2. *L. minima.*—Elongated, smooth; volutions rather convex; aperture less than half the length of the shell, ovate; last whorl not ventricose, *Sower.* Min. Conch. tab. 169, f. 1.—Fresh water formation, Isle of Wight.

3. *L. longiscata.*—Elongated, smooth; aperture ovate, elongated; two-fifths the length of the shell; plait upon the columella obscure, *Sower.* Min. Conch. tab. 343.—Upper fresh water formation, Headon Hill.

4. *L. maxima.*—Ovate elongated, rather obtuse; whorls about six, slightly concave; aperture narrow, occupying less than half the length of the shell, *Sower.* Min. Conch. tab. 538. f. 1.—Fresh water formation, Isle of Wight.

5. *L. columellaris.*—Ovate pointed; spire short; whorls about 5, convex; aperture wide, above half the length of the shell; columella much twisted, and very thick, *Sower.* Min. Conch. tab. 528, f. 2.—Fresh water strata, Hordwell Cliff.

6. *L. pyramidalis.*—Ovate acute; whorls convex; aperture half as long as the shell, dilated; plait of the pillar obscurely divided, *Sower.* Min. Conch. tab. 528, f. 3.—In the fresh water formation of Headon Hill, Isle of Wight.

GEN. XXX. PHYSA.—Shell convoluted; aperture longitudinal; peristome wanting in the body-whorl; margin of the cloak loose, divided into lobes, and capable of being reflected over the surface of the shell, near the mouth.

116. *P. fontinalis.*—Whorls four, increasing suddenly from the apex to the body-whorl, which is very large.

Buccinum exiguum, *List.* An. Ang. 142. Conch. tab. 134, f. 34.—Planorbis Bulla, *Mull.* Verm. ii. 167.—Bulla fontinalis, *Linn.* Syst. i. 1185. *Mont.* Test. Brit. 226.—Ph. font. *Drap.* Moll. 54.—Common in lakes and slow running streams.

Length about half an inch; pellucid, glossy, horn-coloured, with minute lines of growth; whorls rounded; aperture narrow behind; the body-whorl projecting. Animal pale dusky yellow; an interesting object when viewed crawling against the surface of the water, and extending its delicate, transparent, divided cloak over the surface of the shell. The P. alba of Dr Turton, Zool. Journ. vol. ii. p. 363. t. xiii. f. 3, does not appear to be distinct.

GEN. XXXI. APLEXA.—Shell convoluted; peristome entire; pillar-lip with a fold; margin of the cloak entire, and incapable of being reflected over the shell.

117. *A. hypnorum.*—Spire lengthened; aperture rounded anteally.

Bucc. heterostrophon, *List.* Conch. tab. 1059, f. 5.—Planorbis turritus, *Mull.* Verm. Hist. ii. 169.—Bulla hypnor. *Linn.* Syst. i. 1185.—Turbo stagnalis, *Walk.* Test. Min. 15. tab. ii. f. 54,—Bulla hyp. *Mont.* Test. Brit. 228.—Not uncommon in lakes and slow running streams.

Length upwards of half an inch, deep horn-colour, glossy, translucent; whorls four or five, rather flat, the last one occupying two-thirds of its whole length; aperture narrow behind, the outer-lip nearly straight; pillar-lip thick, reflected.

118. *A. rivalis.*—Spire short, pointed; aperture contracted anteally.

Bulla riv. *Maton* and *Rackett*, Linn. Trans. viii. 126. tab. iv. f. 2. *Turt.* Conch. Dict. 26.—Physa subopaca, *Lamark*, Hist. Vert. vol. vi. p. 2. 157. —In slow streams, rare.

Length scarcely half an inch; pale horn-coloured, glossy; whorls five, the last occupying $\frac{4}{5}$ths of the whole length; apex pointed; aperture with the outer-lip more rounded than the last, and the pillar-lip more recurved anteally.—This shell was first recorded as having been found in Hampshire, by Mr Hay. Dr Turton has seen it alive at Naas, in Ireland. Other localities have been mentioned, but they are regarded as spurious.—It is a common shell from the West Indies.

GEN. XXXII. PLANORBIS.—Cavity of the shell entire, sinistral; the vent, pulmonary cavity, and sexual organs on the left side; tentacula filiform.

* *Whorls rounded on the margin.*

119. *P. corneus.*—Whorls four, rounded; concave above; mouth suborbicular.

Cochlea pulla, *List.* An. Ang. 143. Conch. t. 137. f. 41.—Planorbis purpura, *Mull.* Verm. ii. 154.—Helix cornea, *Linn.* Syst. i. 1243. *Penn.* Brit. Zool. iv. 134. *Mont.* Test. Brit. 449.—In ponds and slow streams. England.

Breadth about an inch; brown, glossy; lines of growth distinct; whorls above, increasing rapidly, and forming a central cavity; below, the whorls are nearly on the same plane, well defined by the separating line; last whorl projecting into the cavity of the aperture. When irritated, the animal pours forth a purple fluid from the sides, between the foot and margin of the cloak. The *H. nana* of Pennant is the young of this species.

120. *P. spirorbis.*—Whorls five, rounded; flat above; aperture suborbicular.

Mull. Verm. ii. 161. H. spir. *Linn.* Syst. i. 1244. *Mont.* Test. Brit. 455, Suppl. tab. xxv, f. 2.—In pools.

Breadth about $\frac{3}{10}$ths of an inch; nearly equally flat on both sides; of a brown colour; whorls round, slender, and increasing in size very gradually; deeply divided by the separating line; aperture nearly round, scarcely interrupted by the body-whorl.—This species is stated by Montagu as common in England. In Scotland it has occurred to us only in Livingstone Woods, West Lothian.

121. *P. contortus.*—Whorls six, compressed; flat above, concave below.

Helix con. *Linn.* Syst. i. 1244.—Plan. con. *Mull.* Verm. ii. 162.—H. con. *Mont.* Test. Brit. 457. tab. xxv. f. 6.—In pools and ditches, not common.

Breadth about $\frac{2}{10}$ths of an inch; whorls compressed, rounded, even on the upper side, narrow, and deeply divided by the separating line; beneath, a large central cavity; aperture narrow, bent.

122. *P. albus.*—Concave on both sides, striated transversely and longitudinally; aperture oblique, dilated.

> *Mull.* Verm. ii. 164.—Helix umbilicata quatuor anfractibus apertura subrotunda, *Walk.* Test. Min. 5. tab. 1. 19.—Helix alba, *Mont.* Test. Brit. 459. Supp. tab. xxv. f. 7.—P. hispidus, *Drap.* Moll. 43.—In ponds, common.

Breadth about a quarter of an inch; whorls four, last whorl greatly larger than the preceding one, slightly depressed; aperture entire; lower-lip joining the body, ascending; the upper-lip advanced.

123. *P. nautilus.* — Shell flat above, concave below, with transverse ridges, which, on the margin, form a spinous ridge.

> Turbo Nautilus, *Linn.* Syst. i. 1241.—P. imbricatus, *Mull.* Verm. ii. 165.—Helix, *Walk.* Test. Min. 6. t. i. f. 20, 21.—Turbo Naut. *Mont.* Test. Brit. 466. Supp. t. xxv. f. 5.—In ditches in England, common.

Breadth $\frac{1}{8}$th of an inch; whorls four, flat, but well defined by the separating line; below, a deep cavity, exhibiting more rounded whorls; aperture entire, suborbicular. As the transverse ridges are partly cuticular, they are liable to be rubbed off.

124. *P. nitidus.*—Glossy; a central cavity on both sides; aperture interrupted by the preceding whorl.

> *Mull.* Verm. ii. 163.—Helix fontana, *Lightfoot*, Phil. Trans. 1786, 165. t. 11. f. 1, 4. *Mont.* Test. Brit. 462. t. vi. f. 6.—In ditches, England and Scotland.

Breadth about $\frac{2}{10}$ths of an inch; nearly equally convex on both sides; above, the body-whorl is highest on its central edge, sloping downwards to the exterior margin; the shallow central cavity exhibits the preceding whorls; below, the body-whorl is nearly flat, and the deep central cavity scarcely displays the preceding whorl; aperture subtriangular, the lips on both sides embracing the body-whorl.

** *Whorls carinated.*

125. P. *vortex.*—Whorls six or seven; slightly concave above; beneath flat.

> Cochlea exigua subfusca, *List.* An. Ang. 145. Conch. t. 138. f. 43.—Helix vort. *Linn.* Syst. i. 1243.—Planorbis vort. *Mull.* Verm. ii. 158.—H. vort. *Penn.* Brit. Zool. iv. 133. *Mont.* Test. Brit. 454. Supp. t. xxv. f. 3.—In ditches, England and Ireland.

Breadth $\frac{3}{8}$ths of an inch; whorls increasing gradually, narrow, broadest on the under side; slightly carinated near the lower edge; mouth subtriangular. —In its young state, this seems to be the *Helix rhombea* of Dr Turton, Conch. Dict. 47.

126. P. *complanatus.*—Whorls five, carinated at the lower edge; above, nearly concave; beneath slightly flat.

> Helix comp. *Linn.* Syst. 1242.—Plan. umbilicatus, *Mull.* Verm. 160.—H. comp. *Mont.* Test. Brit. 450. Supp. t. 25. f. 3.—P. marginatus, *Drap.* Moll. 45.—In ponds and ditches, common.

Breadth upwards of half an inch; whorls increasing so as to form a slight concavity; rounded; line of separation deep; close upon the under margin is the keel, which does not enter the subquadrangular aperture; the whorls below slightly rounded; lines of growth distinct; tentacula dusky, dark in the middle.

127. P. *carinatus.*—Whorls four; keel near the middle of the whorl, and entering the aperture.

Cochlea fusca, *List.* An. Ang. 145. Conch. t. 138. f. 42.—Helix Planorbis, *Linn.* Syst. i. 1242.—P. car. *Mull.* Verm. ii. 157.—H. car. *Mont.* Test. Brit. 451. Supp. t. xxv. f. 1.—In ditches.

This shell chiefly differs from the preceding, in the whorls above increasing more rapidly, forming a larger central cavity; in the greater flatness below; in the ridge entering the aperture; and in the tentacula being pellucid yellow.

EXTINCT SPECIES.

1. *P. cylindricus.*—Cylindrical; left side concentrically striated; volutions three or four, adpressed; aperture oblong, quadrangular.—*Sower.* Min. Conch. t. 140. f. 2.—*Fresh-water formation*, Isle of Wight.

2. *P. obtusus.*—Depressed; left side most concave; volutions embracing, slightly compressed on the right; aperture obliquely and obtusely obcordate.—*Sower.* Min. Conch. t. 140. f. 3. Isle of Wight.

3. *P. lens.*—Lenticular, subcarinated; volutions embracing; aperture very oblique, obcordate.—*Sower.* Min. Conch. t. 140. f. 4. Isle of Wight.

4. *P. hemestoma.*—Depressed, smooth; right side convex, umbilicate; left side flat; aperture oblique, subtriangular.—*Sower.* Min. Conch. t. 140. f. 6. *Plastic-clay*, Plumstead.

5. *P. radiatus.*—Lenticular, radiated; left side umbilicate; volutions nearly concealed; aperture obcordate.—*Sower.* Min. Conch. t. 140. f. 5. *Green-sand.*

6. *P. euomphalus.*—Depressed, subcarinated; concentrically striated; right side flat; left side largely umbilicate; aperture subtriangular.—*Sower.* Min. Conch. t. 140. f. 7, 9. Isle of Wight.—The *P. rotundatus* of Brongniart is mentioned in the Mineral Conchology as occurring in Hordwell Cliff, along with *Limnea columellaris*, t. 528. The three last species are probably marine, and belong to the genus Skenea.

GEN. XXXIII. SEGMENTINA.—Shell divided internally by transverse partitions, into several chambers, which communicate with each other by triradiated apertures.

128. S. *lineata.*—Shell convex above, flat beneath, with a central cavity on both sides.

Helix lineata dorso convexo umbilicata margine acuto, *Walk.* Test. Min. 8. t. 1. f. 28.—Nautilus lacustris, *Lightfoot*, Phil. Trans. 1786, 160. t. 1. f. 1, 7. *Mont.* Test. Brit. 191. t. vi. f. 3.—On aquatic plants in ditches, England.

Breadth scarcely a quarter of an inch, glossy, horn-coloured, with a whitish spiral line at the junction of the whorls above; whorls below, flat, with an acute margin; aperture obliquely semioval, the lips clasping the body; chambers distant, three in the body-whorl; partitions of three subtriangular distinct plates, two lateral and one on the central side; these partitions form white centroperipheral lines externally.

GEN. XXXIV. ANCYLUS.—Shell conical; foot short; tentacula short, flat, and a little truncated.

129. A. *fluviatilis.*—Aperture suborbicular; apex lateral.

Patella fluviatilis, *List.* An. Ang. 151. Conch. t. 141, f. 39.—P. lacustris, *Linn.* Syst. i. 1260.—An. fluv. *Mull.* Verm. ii. 201.—P. fluv. *Mont.* Test. Brit. 482. *Don.* Brit. Shells, t. 147.—On stones in rivulets, common.

Length about $\frac{3}{8}$ths, breadth $\frac{2}{8}$ths of an inch; height nearly equal to the breadth; horn-coloured, with concentric wrinkles crossed by faint lines; apex pointed, a little recurved.

130. A. *lacustris.*—Aperture oblong; apex nearly central.

Mull. Verm. 199.—Patella oblonga, *Light.* Phil. Trans. 1786, 168. t. 111. f. 1, 6.—P. lac. *Mont.* Test. Brit. 484. *Don.* Brit. Sh. t. 150.—On plants in ditches and lakes.

Length $\frac{1}{4}$th of an inch; breadth $\frac{1}{8}$th, height scarcely $\frac{1}{10}$th of an inch, thin, smooth, greenish, compressed; apex low, pointed, recurved.

EXTINCT SPECIES.

1. *A. elegans.*—Convex, subconical; aperture longitudinally obovate; apex oblique, eccentric, near the narrowest part of the aperture.—*Sower.* Min. Conch. t. 533.—Found in dark-grey sand of the *London* clay, at Hordwell, by Charles Lyell, Esq. *jun.*

BRANCHIFERA.

I. Tribe.—*Nudibranchia.*

a. Branchiæ when at rest not covered by a lid. NUDIBRANCHIA.
  b. Branchiæ issuing from the cloak dorsally.
    c. Body destitute of a shell. Marine.
      d. Anus situate near the posterior extremity of the back, and surrounded with a fringe of plumose branchiæ.
        Doris.
        Polycera.
      dd. Anus on the right side unconnected with the branchiæ, which are disposed along the back and sides, and unconnected with membranaceous expansions. Jaws corneous.
        e. Tentacula two in number.
          Tergipes.
          Tritonia.
        ee. Tentacula four in number.
          Montagua.
          Eolida.
    cc. Body covered by a spiral shell. Lacustrine.
      Valvata.
  bb. Branchiæ issuing latterly from between the cloak and the foot. Body protected dorsally by a shell. *Cyclobranchia.* Marine.
    Patella.
    Chiton.
aa. Branchiæ single, when at rest concealed under a lid. TECTIBRANCHIA. Marine.
  b. Head with tentacula.
    Aplysia.
    Pleurobranchus.
  bb. Head destitute of tentacula.
    Bulba.

II. Tribe.—*Pectinibranchia.*

a. Heart entire, and detached from the rectum. CRYPTOBRANCHIA.
aa. Heart with two auricles, and traversed by the rectum. SCUTIBRANCHIA.

Gen. XXXV. DORIS.—Oral, tentacula two; vent destitute of scales.

131. D. *Argo.*—Body nearly smooth; branchial plumes about twelve in number.

Linn. Syst. i. 1083. *Penn.* Brit. Zool. iv. 43. t. xxii. f. 22.—Among the sea-weeds and crevices of rocks near low water-mark, common.

The usual length is about 3 inches, convex above, and rounded at each extremity; of a lemon-yellow colour, slightly freckled, sometimes tinged with brown. Spawn white, gelatinous and compressed.

132. D. *verrucosa.*—Cloak closely covered with prominent tubercles; branchial plumes about 24 in number.

Penn. Brit. Zool. iv. 43. t. xxi. f. 23. *Cuvier*, Ann. Mus. iv. t. lxxiii. f. 4, 5.—Common with the preceding; frequently cast ashore by storms.

Length about an inch, of a whitish colour, more or less freckled with brown. The tubercles are rough, and of different sizes, those at the base of the upper tentacula are compressed; they are pervious at the summits. Margin entire, waved. Tentacula round and smooth towards the base, compressed and imbricated towards the summit. Branchial plumes arranged in a semicircle, those at each end shortest.

133. D. *lævis.*—Cloak smooth in the middle, slightly tuberculated towards the margin; branchial plumes 8 in number.

Mull. Zool. Dan. t. xlvii. f. 3–5.—Common among the Zetland Isles.

Length about half an inch, rounded in front, narrow behind; of a milk-white colour.

134. D. *marginata.*—Cloak smooth, tinged with pink; an undulating membranaceous border, usually four pointed, in front.

Mont. Linn. Trans. vii. 79. t. vii. f. 7.—Coast of Devonshire.

Length about a quarter of an inch, oval, whitish; tentacula wrinkled; the branchial plumes are figured as 7 in number, and the head as slightly emarginate.

This species is certainly distinct from the *D. lævis* of Muller, to which Montagu refers it; though it may be no other than the *D. electrina* of Pennant, whose notices, however, are too imperfect to give much weight to the conjecture.

135. D. *nodosa.*—Cloak with four equidistant papillæ on each side the medial line.

Mont. Linn. Trans. ix. 107. t. vii. f. 2.—Coast of Devon.

Length about half an inch; white, with a tinge of pink on the back. Foot broad in front, pointed behind, forming a membranaceous border. Upper tentacula short, perfoliated towards the extremity.—According to Montagu, this species is rare on the coast of Devon. I have once observed it among the rocks at St Andrew's.

136. D. *quadricornis*.—Cloak smooth in the middle, with a row of obsolete tubercles on each side; tentacula approximating in pairs.

Mont. Linn. Trans. xi. 17. t. iv. f. 4.—Coast of Devon.

Length ⅜ths of an inch, mottled with brown and white; tentacula long, slender; branchial plumes about 8 in number.

137. D. *nigricans*.—Cloak thickly covered with short lanceolate tubercles; branchial plumes about 8 in number.

Flem. Edin. Encyc. vol. xiv. p. 618.—Zetland.

Length about half an inch, pale, freckled with dusky; cloak emarginate anteally; sheath of the superior tentacula notched in the margin.

Gen. XXXVI. POLYCERA.—Oral, tentacula exceeding two in number; branchiæ, when at rest covered, by two scales.

138. P. *flava*.—Oral, tentacula four; superior tentacula awl shaped; branchial scales smooth, produced.

Doris flava, *Mont.* Linn. Trans. vii. 79. t. vii. f. 6.—Coast of Devon.

Length upwards of half an inch, narrow behind; body spotted with bright orange yellow; branchial plumes 7 in number, behind which are the long scales or fleshy appendages.

139. P. *pennigera*.—Upper tentacula subclavate, perfoliate, with a bifid basilar sheath.

Doris penn. *Mont.* Linn. Trans. xi. 17. t. iv. f. 5.—Devon coast, rare.

Length an inch; bifid anteally, acuminated behind; spotted with orange and black; branchial plumes 5, with two bifid appendages.—The absence of the oral tentacula, and the peculiar character of the superior ones, and of the branchial appendage, mark this species as the type of a new genus, which may be termed Thecacera.

In 1814 I observed an animal in a pool among the rocks on the shore near Aberbrothock, Angus-shire, which probably belonged to the genus *Polycera*, but which I was unable to secure. The oral tentacula were 6 in number; the superior tentacula produced, and beautifully pinnate; the branchial plumes were numerous; body wide before, becoming very narrow behind the vent.

Gen. XXXVII. TERGIPES.—Branchiæ, furnished with a sheath at the base, in a single row on each side, and capable of acting as suckers.

140. T. *maculatus*.—Branchiæ, 4 on each side and 1 near the extremity of the body, consisting of a clavate sheath with a sexpartite margin, and a concave summit with a central papilla.

Doris maculata, *Mont.* Linn. Trans. vii. 80. t. vii. f. 8, 9.—Coast of Devon.

Length about a quarter of an inch, of a slender form, the front obtuse, tapering behind, of a pale yellow, with minute pink spots; tentacula slender, filiform, with a large trumpet-shaped basilar sheath.

GEN. XXXVIII. TRITONIA.—Branchial plumes in a row on each side the back, and destitute of basilar sheaths.

141. T. *Hombergii.*—Branchiæ forming a continuous plumose crest on each side the cloak, between which and the margin of the foot, the body is compressed and smooth.

Cuv. Ann. Mus. i. t. xxxi. f. 1, 2.—(Limace de mer palmifere, *Diquemare*, Journ. Phys. Oct. 1785, t. ii.)—Firth of Forth.

Length upwards of 2 inches, sometimes approaching to 8; of a purplish colour. Cloak convex, thickly covered with unequal soft tubercles; tentacula consisting of five plumose divisions, each surrounded at the base by a prominent ring.—This, the largest species of the genus, was first detected in our seas by J. G. Dalyel, Esq. the learned author of the treatise on the *Planariæ*.

142. T. *arborescens.*—Branchiæ, 5 or 6 on each side, in the form of plumose tubercles.

Doris arb. *Mull.* Zool. Dan. Prod. p. 229.—Fab. Fauna gr. 346. T. arb. *Cuv.* Ann. Mus. vi. t. lxi. f. 8–10. *Flem.* Edin. Encyc. xiv. 619.

Length about an inch; foot narrow, sides compressed; cloak smooth, its margin above the mouth with four plumose appendages; branchiæ decreasing in size towards the tail; tentacula conical, transversely striated; the sheath with a divided margin. I have found this species in the Zetland Isles, agreeing with the characters of Cuvier, with this difference, that the branchiæ in his are only 5 on each side, while in our specimen they appeared to be 6. But as the two posterior ones are very small, and as his examples were preserved in spirits, it is probable that they have escaped detection. It has likewise been found in the Frith of Forth, by Dr Grant, who, when keeping it confined in a glass vessel, observed that it possessed the power of emiting distinctly audible sounds.

143. T. *pinnatifida.*—Branchiæ 9 on each side, ovate and imbricated with conical papillæ.

Doris pin. *Mont.* Linn. Trans. vii. 79. t. vii. f. 2, 3.—Coast of Devon.

Length $\frac{3}{10}$ths of an inch; body slender, rounded in front, tapering behind, of a grey colour, spotted with green. Tentacula filiform, with a trumpet-shaped basilar sheath. The branchiæ are longer than the breadth of the the body, and the papillæ, which have black tips, are arranged in 5 or 6 whorls.

144. T. *bifida.*—Branchiæ, in a single row on each side, numerous, unequal, ovate, pedunculated.

Doris bif. *Mont.* Linn. Trans. xi. 198. t. xiv. f. 3.—Coast of Devon.

Length about a quarter of an inch; body linear, acuminated behind, the front rounded, of a whitish colour, with a reddish brown line on each side of the back. Sheath of the tentacula broad, erect, bifid; behind which are two black eyes. Branchiæ, 12 on each side, 3 in each division larger than the rest, the club semitransparent, uniform on the surface, but complicated within.

GEN. XXXIX. MONTAGUA.—Branchiæ in continuous rows across the back; a cluster of short papillæ on the right side.

145. M. *longicornis.*—Anterior tentacula filiform, produced, superior ones short; branchiæ linear.

Doris long. *Mont.* Linn. Trans. ix. 107. t. vii. f. i.—Coast of Devon.

Length half an inch; body slender, acuminated behind, of a yellowish-white, tinged with pink; eyes 2, at the base of the superior tentacula. The cluster of papillæ near the eyes; branchiæ, in four transverse rows, pink, spotted with white.

146. M. *cœrulea.*—Tentacula linear, nearly of equal length; branchiæ ovate.

Doris cœr. *Mont.* Linn. Trans. ix. 78. t. vii. f. 4,5.—Coast of Devon.

Length a quarter of an inch; of a green colour; the eyes at the base of the superior tentacula. Papillæ two, oval, of a pink colour, placed between the second and third row of branchiæ, and a little inclining to one side; branchiæ in 5 or 6 rows, green at the base, blue in the middle, and orange at the tip; body of a linear form.

GEN. XL. EOLIDA.—Branchiæ interrupted on the back.

147. E. *papillosa.*—Sides thickly covered with subulate branchiæ.

Doris, *Baster.* Op. Sub. i. 81. t. x. f. 1.—Limax papillosus, *Linn.* Syst. i. 1082.—Purple Doris, Cordiner, Rem. Ruins, No. xxi. f. D.—Dor. papil. *Mull.* Zool. Dan. t. cxlix. f. 1–4. *Mont.* Linn. Trans. xi. 16. t. iv. f. 3.—D. vermigera, *Turton,* Brit. Fauna, 133.—Common, among sea-weeds, near low water.

Length nearly 3 inches, of a brownish colour, tinged with purple. Tentacula linear, the lower ones smooth, the upper ones annulated. The branchiæ appear to be disposed obliquely in rows, containing about ten in each; they cease before reaching the retral extremity.

148. E. *plumosa.*—A single row of simple linear branchiæ on each side.

Tritonia plumosa, *Flem.* Edin. Encyc. xiv. 619.—In Zetland.

Length about half an inch. The superior tentacula pinnated towards the dextral extremity; the front ones simple.

149. E. *pedata.*—Branchia collected in four tufts on each side. Tentacula subclavate, wrinkled.

Doris ped. *Mont.* Linn. Trans. xi. 197. t. xiv. f. 2.—Coast of Devon.

Length half an inch, body slender, acuminated, of a pink colour. The eyes behind the superior tentacula. Branchiæ inclining to a scarlet colour, filiform, numerous in each tuft. Foot with a lateral fleshy expansion on each side.

150. E. *purpurascens.*—Five bundles of branchiæ on each side. Tentacula linear.

Flem. Phil. Zool. ii. 470. t. iv. f. 2.—Frith of Tay.

Length about an inch, slender, pointed behind, rounded in front, of a pink colour. Anteal tentacula, shorter than the superior ones, which have the eyes behind. Three filiform branchiæ in each bundle.

GEN. XLI. VALVATA.—Shell spiral; aperture circular, operculated. Branchiæ single, plumose issuing from the neck.

151. V. *cristata.*—Shell depressed, of three or four whorls, nearly flat above, concave below.

Mull. Verm. ii. 198.—Helix cornea quatuor anfractibus apertura rotunda, *Walk.* Test. Min. 5. t. i. f. 18.—Helix exist. *Mont.* Test. Brit. 460. fig. i. f. 7, 8.—In rivers and ditches, England.

Breadth about $\frac{1}{10}$th of an inch, light horn-coloured; whorls rounded, increasing gradually, slightly wrinkled across; the central cavity exposes all the whorls; aperture attached to the body-whorl, but not interrupted by it; operculum spirally striated. Animal dusky, tentacula three, two placed in front, at the base of which are the eyes, and one on the right side, corresponding with the branchia, setaceous and produced. Front emarginate.

152. V. *piscinalis.*—Shell turrited, whorls four or five, rounded, with a large central cavity.

Nerita pis. *Mull.* Verm. ii. 172.—Turbo tribus anfractibus, umbilicatus apertura subrotunda, *Walk.* Test. Min. 15. t. ii. f. 56.—Turbo fontinalis, *Mont.* Test. Brit. 348. t. xxii. f. 4.—In lakes and slow running streams, common.

Breadth and height about a quarter of an inch. Whorls increasing rapidly, yellowish-brown, distinctly striated across; central cavity distinct, but not large; apex obtuse; aperture orbicular, lip thin, slightly attached to the body-whorl; operculum spirally striated, with a central knob. Animal like the last.

GEN. XLII. PATELLA. LIMPET.—Shell entire, conical; snout with two pointed tentacula, with eyes at the base; tongue long, strap-shaped, covered with three rows of interrupted reflected short spines.

153. P. *vulgata.* Common Limpet.—Shell with about fourteen obsolete angles; apex nearly central, blunt.

P. ex livido cinerea, striata, *List.* An. Ang. 195.; Conch. t. DXXXV. 14. P. vul. *Linn.* Syst. i. 1258. *Mont.* Test. Brit. 475.—Common on rocks, near low water-mark.

Shell sometimes 2½ inches long, and 2 inches broad in the aperture, and 1½ inch in height. It is subject to great variation in the height of the apex, the elevation and number of the markings, the form of the aperture, and the thickness. Foot oval, snout subcylindrical; margin of cloak fringed; branchial circle complete.—This species is of great value as a *bait* in our fisheries, and even as an article of food.

154. P. *intorta.*—Shell with numerous rough ribs; apex prominent, submarginal, and slightly decurved.

Penn. Brit. Zool. iv. 143. t. xc. f. 148. *Don.* Brit. Sh. t. cxlvi. *Laskey,* Wern. Mem. i. 411. *Mont.* Test. Brit. Supp. 154.—Shores of Anglesea, coast of Devon, and Frith of Forth, rare.

Length three quarters, breadth half an inch, slightly depressed anteally, of a brown colour; the ribs are unequal, covered, especially towards the margin, with arched reflected scales. Montagu compares it, when at a distance, to a nutmeg.

155. P. *pellucida.*—Shell ovate, thin, pellucid, with lines of rich azure spots from the apex to the margin.

P. mima, levis, pellucida, aliquot cœruleis lineis eleganter insignita, *List.* Conch. t. DXLIII. f. 27.—P. minor, *Wall.* Ork. 41.—P. pull. *Linn.* Syst. i. 1260. *Penn.* Brit. Zool. iv. 143.—Common, on the broad leaves of various Fuci.

Length sometimes nearly an inch, breadth $\frac{5}{8}$ths, height $\frac{3}{8}$ths; nearly smooth, glossy, apex near the margin, frequently obsolete. The coloured lines vary in number; in young specimens they are sometimes wanting, but in their place lines of brown. The branchial circle is interrupted at the head. The margin of the cloak is fringed with filaments of unequal length.

156. P. *lævis.*—Shell concentrically wrinkled, apex tubercular, subcentral.

List. Conch. t. DXLII. f. 26. *Penn.* Brit. Zool. iv. 144. t. xc. f. 151.—P. cœrulea, *Mont.* Test. Brit. Supp. 152.—On the stalks of the larger Fuci, common.

Length upwards of an inch, breadth $\frac{8}{10}$ths, height $\frac{5}{10}$ths, of a brown colour, with purple lines from the apex. It is more or less wrinkled concentrically, and in old specimens ribbed longitudinally. In the young state, two small black spots are sometimes observable. It is distinct in its growth and habit from the preceding species, with which it has been frequently confounded.

157. P. *virginea.*—Shell oval, slightly wrinkled concentrically, with numerous reddish lines from the apex to the margin.

Mull. Zool. Dan. Prod. 237; Zool. Dan. t. xii. f. 2, 3.—P. parva, *Mont.* Test. Brit. 480.—On rocks and stones near low water-mark, common.

Length about $\frac{4}{10}$ths, breadth $\frac{3}{10}$ths, and height $\frac{1}{10}$th of an inch, of a reddish-white colour, translucent; apex a little in front of the centre, obtuse. Old shells become opake, and cease to exhibit the coloured lines. Tentacula white; cloak subrufous, with an entire margin.—The *P. tessulata* of Zool. Dan. nearly resembles this species, and, perhaps on our shores has been confounded with it. It is distinguished by the coloured lines being interrupted, and the margin of the cloak ciliated.

* * *

The *P. Clealandi* described by Mr Sowerby, in the extracts from the Minute-Book of the Linn. Soc. vol. xiii. 621., as found on stones at low water-mark, near Bangor, by James Clealand, Esq., is stated as possessing the following characters: "Shell oval, white, with red, brown, or purple spots; faintly striated longitudinally, and still more faintly transversely; summit obtuse, lateral, tinged with light purple; margin entire; inside white, with a dark brown muscular impression.—The young shells are very thin, but the old are nearly opake. The size of the largest specimen yet found, is 9½ tenths of an inch in length, $\frac{7}{10}$ths in breadth, and $\frac{4}{10}$ths in height. There is a dark brown variety, with two indistinct rays from the apex, one on each side.

It is impossible to determine, from the scanty notices which are given by Walker, what was the true character of his P. plana orbiculata margine regulariter dentato. The colour white and opake.—*Test. Min. Rar.* 5. t i. f. 16.

◆

EXTINCT SPECIES.

1. P. *latissima.*—Nearly orbicular, flat, smooth, thin; umbo excentric.—*Sower.* Min. Conch. t. cxxxix. f. 1-5.—In *Slaty Clay*, Lincolnshire.

2. P. *lævior.*—Depressed, conical, smooth, shining; base obovate; apex excentric.—*Sower.* Min. Conch. t. cxxxix. f. 3, 4.—*Alum Clay*, Whitby.

3. P. *æqualis.*—Conical, smooth; base obovate; back nearly perpendicular.—*Sower.* Min. Conch. t. cxxxix. f. 2.—In *Crag*, Suffolk.

4. P. *rugosa.*—Depressed, obovate, radiated; apex excentric, depressed, slightly recurved; back concave above, with reflected undulations.—Patellite, *Park.* Or. Rem. iii. 50. t. v. f. 21.—*Sower.* Min. Conch. t. cxxxix. f. 6.—In *Lower Oolite*, Gloucestershire.

5. P. *striata.*—Oblong, irregularly conical, with numerous acute radii; umbo forward, sharp.—*Sower.* Min. Conch. t. ccclxxxix.—*London Clay*, Stubbington.

6. P. *lata.*—Obovate, depressed, nearly smooth, radiated; radii about 30. distant, rounded; apex very excentric.—*Sower.* Min Conch. t. cccclxxxiv. f. 1.—*Lower Oolite*, Stonefield.

7. P. *ancyloidis.*—Convex, smooth; apex spiral; base oval.—*Sower.* Min. Conch. t. cccclxxxiv. f. 2.—Ancliff.

8. P. *nanus.*—Obliquely smooth; base oval; apex obtuse.—*Sower.* Min. Conch. t. cccclxxxiv. f. 3.—Ancliff.

Mr Mantell notices "a small species of Patella of an oval shape, conical, depressed; the casts of the interior of the shell only have been discovered" in *Green Sand*, Parham Park.—Geol. Suss. 72.

GEN. XLIII. CHITON.—Shell divided, constituting a series of imbricated dorsal plates, eight in number; mouth with a semicircular curved membrane above, destitute of tentacula. Tongue short, armed with spines.

* *Marginal band with tufts of spines.*

158. C. *fascicularis.*—Shell oblong, ovate, roughly shagreened on the sides, with a striated longitudinal mesial stripe.

Linn. Syst. i. 1106. *Mull.* Zool. Dan. p. 250. No. 3017. *Pult.* Dorset, 25. *Mont.* Test. Brit. 5. t. xxvii. f. 5.—On oysters, but not common.

Length upwards of half an inch, breadth about a quarter; freckled with green and brown. The granular tubercles are circular, with flat summits; they are numerous on the sides of the plates, but not on the subcarinated centre. The border is rough, with a spinous margin. The tufts consist of cylindrical, blunt, smooth, solid, calcareous spines of unequal size; one at the junction of each valve, six on the anteal margin, and two at the retral valve, making twenty in number.—I am inclined to think that the *Chiton* *crinitus* of Pennant, Brit. Zool. iv. 71. t. xxxvi. f. 1., which he describes "with seven valves; thick set with short hairs; ⅝ths of an inch long," as inhabiting the sea near Aberdeen, is no other than this species. In the figure may be traced the tufts and the central striated ridge; characters unnoticed in the description,—and, it may be added, that the figure given by Maton and Rackett of the *Chiton fascicularis*, Linn. Trans. viii. t. i. f. 1., bears no remote resemblance to the one by Pennant, now referred to.

* *Marginal band rough.*

159. C. *marginatus*.—Shell with a central ridge, regularly shagreened.

Penn. Brit. Zool. iv. 71. t. xxxvi. f. 2. *Mont.* Test. Brit. i. *Maton* and *Rackett*, Linn. Trans. viii. 21. t. i. f. 2. *Flem.* Edin. Encyc. vi. 102. C. cinereus, *Lowe*, Zool. Journ. vol. ii. p. 99.—On stones about low water-mark, common.

Length about ⅝ths of an inch, breadth ⅜ths. Colour greyish or reddish, sometimes freckled. Anteal and retral valves with about ten notches on the margin of each, on the lower edge; the intervening valves with only one notch on each side, the termination of a flexure in the shell, which extends obliquely to the back of the ridge, and divides each side of the valve into two triangular compartments, the retro-lateral ones being always more elevated. In the last valve the lines of growth are elliptical and entire. The margin of the shell, around, is a little depressed. Body rough, dusky brown, sometimes freckled with white, with a spinous margin. Branchiæ about twenty on each side.—I possess a variety of this shell, which I found under a stone at Newhaven in 1811, with only six valves. Is the *Chiton Asselloides* of Mr Lowe, Zool. Journ. vol. ii. 100. t. v. f. 5., any thing else than an indistinctly marked variety of the present species. The fringe being short and indistinct, might lead to the suspicion that it was the same as *C. marmoreus* of Fabricius, though that species is probably not distinct from *C. marginatus*.

160. C. *ruber*.—Smooth, glossy, marked by distinct lines of growth.

Patella articulata cymbiformis, *Wallace*, Ork. 41.—C. ruber. *Linn.* Syst. Nat. i. 1107.—C. lævis, *Penn.* Brit. Zool. iv. 72.—C. ruber. *Flem.* Edin. Encyc. viii. 102. *Lowe*, Zool. Journ. ii. 101. t. v. f. 2.—On stones at low water-mark, common.

Length about half an inch, breadth a quarter. Colour reddish, mottled or striped with brown and white. This is more sharply arched than the preceding, producing a higher dorsal ridge; valves with blunt beaks, perfectly smooth, except by the lines of growth, with marginal notches nearly like the last; border broad, striped brown and white, with a nearly entire margin.—This species is very common in Orkney and Zetland: we have found it likewise in abundance on the shores of Loch Broom, whence Pennant's specimens were obtained.—Mr Lowe has found it on the Yorkshire coast.

161. C. *cinereus*.—Valves short, depressed, moniliformly striated.

Linn. Syst. Nat. i. 1107. *Mont.* Test. Brit. 3. *Flem.* Edin. Encyc. vii. 102.—C. Assellus, *Lowe*, Zool. Journ. ii. 101. t. v. f. 3.—On stones and old shells at low water, not uncommon.

Length about half an inch, breadth about a quarter. Colour greyish, with dusky stripes; valves little raised in the middle, and but slight beaked; markings of growth indistinct; striæ longitudinal on the anteal, and diagonal on the retral compartment; under margin of the valves granulated, not notched. Border narrow, with an indistinct fringe.

*** *Marginal band striated, and like hair-cloth.*

162. C. *lævis.*—Valves smooth, with distinct lines of growth.

Mont. Test. Brit. 2. *Flem.* Edin. Encyc. vii. 102. *Lowe*, Zool. Journ. ii. 97.—On stones, not common.

Length rarely half an inch; breadth about a quarter, reddish, mottled with white. Valves arched, slightly beaked, raised at the sides; when highly magnified, they appear minutely punctured; border broad, striped brown and white, the margin with a short fringe.—A specimen found by Captain Carmichael at Appin, is 1 inch and $\frac{2}{10}$ths in length. Montagu mentions a variety with seven valves, which he has termed *Chiton septemvalvis.*

163. C. *albus.*—Valves minutely punctured, the first very large.

Linn. Syst. Nat. i. 1107. *Fab.* Faun. Gr. 422. *Mont.* Test. Brit. 4. *Flem.* Edin. Encyc. viii. 103.—On hills, rare.

Length $\frac{2}{8}$ths, breadth $\frac{1}{8}$th of an inch, narrow, white. Valves short in proportion to their breadth, considerably elevated in the middle, slightly beaked; the lines of growth distinct on the sides. Border narrow, margin nearly entire.

**** *Marginal band smooth.*

164. C. *lævigatus.*—Valves regularly shagreened, the lines of growth distinct.

Flem. Edin. Encyc. vii. 103.—C. latus, *Lowe*, Zool. Journ. ii. 103. t. v. f. 6, 7.—Under stones, but not common.

Length nearly an inch, breadth about half an inch, colour rufous, mottled with brown and white; the colouring of the front valve frequently disposed in transverse zigzag lines, which is the case, but less distinctly, in the other parts of the surface. Valves high in the middle, slightly beaked; diagonal fold elevated; border smooth, with a nearly entire margin.—This species I have found plentiful in Zetland, and on the shores of Lochbroom: Captain Carmichael and Mr Lowe have likewise found it on the coast of Argyle.

The references of the preceding species to the *Testacea Britannica*, cited above, may be relied on, in consequence of interchange of specimens between the late Mr Montagu and the author.

GEN. XLIV. APLYSIA.—Tentacula four; branchiæ lateral; lid corneous.

165. A. *depilans.*—Body of a purplish colour, with black dots.

Linn. Syst. Nat. i. 1082. *Penn.* Brit. Zool. iv. 42. t. xxi. f. 21.—A. hybrida, *Sower.* Brit. Musc. t. liii.—A. depilans and mustilina, *Penn.* Brit. Zool. ii. ed. iv. 79.—Not uncommon among sea-weeds a little beyond low water-mark.

Length from five to six inches and upwards; ovate, with a produced neck; foot narrow; head slightly emarginate, with a tentaculum on each side; in front of the superior tentacula on the neck are two black points or eyes; branchiæ on the right side, under a lid, capable of expanding into a complicated plumose ridge; within the longitudinal lips are two corneous plates or jaws. This animal pours out a purple fluid from under the branchial lid when taken.

166. A. *punctata.*—Body brown, with numerous white spots.

Cuv. Moll. t. i. f. 3–5. *Flem.* Edin. En. xiv. p. 623.—Coast of Devon and Orkney.

This species resembles the last in structure, and differs in nothing but colour. Cuvier indeed states, as a distinguishing character, the naked central spot on the lid; but this is accidental. Montagu informed me, by letter 17th February 1811, that this animal was common along with the other kind (of which he considered it, probably justly, as a variety), and so large "as to fill a moderate sized tea-cup." It has only once occurred to myself in the Bay of Kirkwall, though the A. *depilans* is common on the Scottish coast.

167. A. *viridis.*—Body of a green colour.

Mont. Linn. Trans. vii. t. vii. f. 1.—Coast of Devon.

"With the fore-part of the body like a common *Limax;* tentacula or feelers two, flat, but usually rolled up, and appear like cylindric tubes; at a little distance behind the tentacula, on each side, is a whitish mark, in which is placed a small black eye; the body is depressed, and spreads on each side into a membranaceous fin, but which gradually decreases from thence to the tail, or posterior end; this membranous part is considerably amorphous, but is usually turned upwards on the back, and sometimes meeting, though most times the margins are reflected; this, as well as the back, is of a beautiful grass-green colour, marked on the superior part of the fins or membrane with a few small azure spots, disposed in rows; the under part with more numerous, but irregular, spots of the same; the fore-part of the head is bifid; the lips marked by a black margin; the sustentaculum is scarcely definable, as it most commonly holds by a small space close to the anterior end, and turns the posterior end more or less to one side; it sometimes, however, extends itself for the purpose of locomotion, in which it scarce equals a snail."—"Although this animal does not strictly correspond with the characters prefixed by Linnæus to the genus *Laplysia*, yet it approximates so nearly to the *depilans*, in its external form, that we cannot hesitate to place it with that animal, though we could not discern any membranaceous plate or shield under the skin on the back." *Mont.*—The characters here assigned to this species are such as to excite the belief that it is not an Aplysia; but they are not sufficiently minute to enable us to establish another genus for its reception. It is probably related to the Planariæ.

GEN. XLV. PLEUROBRANCHUS.—Tentacula two; cloak and foot expanded, the former strengthened by a thin expanded subspiral shell.

168. P. *plumula.*—Cloak broad, reticulated; foot pointed.

Bulla plumula, *Mont.* Test. Brit. 214. vig. 2. f. 5; the shell t. xv. f. 9. —Coast of Devon.

Length about an inch; pale yellow; tentacula broad, with eyes at the base above; feet large, with waved edges; branchia, a plumose appendage on the right side.—The shell is oval, depressed, pellucid, thin, concentrically wrinkled, with a minute single whorl near one end.

169. P. *membranaceus.*—Cloak covered with conical papillæ; foot rounded, with an irregularly indented margin.

Lamellaria mem. *Mont.* Linn. Trans. xi. 184. t. xii. f. 3; the shell fig. 4. —English coast.

Length and breadth about two inches; of a brownish colour, paler above, and spotted with bluish-grey beneath; tentacula subcylindric, with two eyes at the base; a cylindrical snout; shell ovate, very thin, flat, with a minute lateral whorl; silvery, tinged with pink.

GEN. XLVI. BULLA.—Body in front with a fleshy expansion or tentacular disc; behind with a membranaceous appendage or lid; shell convoluted; aperture the whole length of the shell.

* *Shells with a cuticle, external.*

170. B. *lignaria.*—Shell ovate, spirally striated; mouth wide, anteally, rendering the pillar visible to the end.

Concha veneris major leviter et dense striata, *List.* Conch. t. lxxiv. f. 71. —B. lig. *Linn.* Syst. i. 1184. *Penn.* Brit. Zool. iv. 116.—B. scabra, *Mull.* Zool. Dan. t. 71.—B. lig. *Mont.* Test. Brit. 205.—Not uncommon.

Length upwards of 2 inches; width 1¼th of an inch; epidermis brown; aperture contracted retrally by the body-whorl; the apex depressed; pillar-lip rounded; outer lip nearly straight; gullet large, folded; stomach fortified by three testaceous plates.

171. B. *akera.*—Shell ovate, smooth; aperture wide, and rendering the pillar visible.

Akera bullata, *Mull.* Zool. Dan. t. lxxi. f. 2, 9.—B. resiliens, *Don.* Brit. Shells, t. lxxix.—B. akera, *Mont.* Test. Brit. 219.—On the shores of Banff and Devon.

Length about ¾ths of an inch; breadth half an inch; translucent, elastic, glossy, with a greenish tinge. Aperture wide anteally; retrally it is very close to the body-whorl, but does not adhere until it has taken almost one volution; apex concave, exhibiting two or three volutions. The Rev. Charles Cordiner observed this shell in the Murray Frith, and transmitted specimens to the Duchess of Portland.—On some parts of the English coast it is not uncommon.

172. B. *hydatis.*—Shell subglobular, minutely striated spirally; aperture wide anteally; the pillar-lip rounded, but the pillar not visible to the end.

Linn. Syst. i. 1183.—B. ampulla, *Penn.* Brit. Zool. iv. 116.—B. hyd. *Don*, Brit. Shells, t. lxxxviii.—On the English coast.

Length 1 inch; breadth ¾ths; translucent, with a brownish epidermis; aperture interrupted by the rounded body-whorl; apex concave, but not exhibiting volutions. Animal purplish-brown; and, when expanded, double the length of the shell; two eyes on the tentacular disc, sunk in small white depressions.—*Mont.* Linn. Trans. ix. 106. t. vi. f. 1.

173. B. *Cranchii.*—Shell subcylindrical, strongly striated spirally; aperture narrow, rendering the continuation of the pillar invisible; pillar-lip straight.

Mr Prideaux, Plymouth Sound.

Length $\frac{6}{10}$ths, breadth $\frac{4}{10}$ths of an inch; translucent, horn-coloured; striæ in bands, slightly waved by indistinct lines of growth; the pillar-lip is a little reflected, forming a pillar cavity, and is slightly waved where it joins the outer lip; the latter projects very little; the apex is concave, without visible whorls. The specimen from which the preceding description was taken was sent me, under the above title, several years ago, by my friend Dr Leach. The detailed description of its characters may be expected in his long wished-for work on the British Molluscous Animals.

174. B. *ampulla.*—Shell oblong, ovate, smooth, mottled with brown.

Mont. Test. Brit. ccvi. t. vii. f. 1.—In Falmouth Harbour, *Montagu;* Dunbar, *Laskey.*

Length $\frac{3}{8}$ths of an inch; opake; aperture moderately wide; on the lower end of the pillar-lip the shell is thickened, of an opake colour, but the duplicature does not spread up the body of the shell. Montagu was probably mistaken in referring his species to the *Ampulla* of Linnæus, with which it does not agree in shape or form of the aperture.

175. B. *umbilicata.* — Shell oblong-oval, smooth; aperture narrow, a little dilated anteally.

Mont. Test. Brit. ccxxii. t. vii. f. 4. *Turton,* Conch. Dict. 22.—Coast of England and Ireland.

Length $\frac{1}{8}$th of an inch; breadth $\frac{1}{16}$th; of a white colour; apex rounded into a cavity.

176. B. *cylindracea.*—Shell lengthened cylindrical; aperture narrow; pillar-lip with an indistinct fold.

C. V. exigua alba vere cylindracea, *List.* Conch. t. dccxiv. f. 70.—B. cyl. *Penn.* Brit. Zool. iv. 117. t. lix. f. 85. *Don.* Br. Sh. t. 120. *Mont.* Test. Brit. xxi. t. vii. f. 2.—In sandy bays, common.

Length $\frac{5}{8}$ths of an inch; smooth, glossy white; outer lip thin, straight; pillar-lip thickened with an oblique fold; apex truncated, depressed.—Perhaps this species should be transferred to the genus Volvaria of Lamarck, as he has hinted.

177. B. *truncata.*—Shell subcylindrical, truncated, and deeply marked with the lines of growth retrally, rounded and smooth anteally.

B. crassa, *Walk.* Test. Min. xvii. t. iii. f. 62.—B. tr. *Adams,* Linn. Trans. vol. v. 1. t. i. f. 12. *Mont.* Test. Brit. 223. t. vii. f. 5.—Not uncommon.

Length about the eighth of an inch, white, closely pellucid; aperture narrow, opposite the body, suddenly widening at the pillar, exhibiting the internal volutions; apex with a cavity.

178. B. *obtusa.*—Shell subcylindrical; apex exhibiting a projecting obtuse spire of three or four whorls.

Voluta alba opaca longitudinaliter striata, *Walk.* Test. Min. 17. t. iii. f. 61.—B. ob. *Mont.* Test. Brit. 223. t. vii. f. 3, common.

Length $\frac{2}{8}$ths, breadth $\frac{1}{8}$th of an inch, with a brownish epidermis; lines of growth distinct; aperture narrow retrally, widening at the pillar; outer lip slightly incurved in the middle.

179. B. *alba.*—"Shell oval, oblong; slightly striated longitudinally; entirely white; crown umbilicate; at each extremity three transverse punctured striæ."

Dr Turton, Zool. Journ. No. vii. 364. t. xiii. f. 6.—British Channel.

Dr Turton adds, "They are more elongated than the Bulla ampulla (the reference is evidently here intended for the *B. striata* of Lamarck, not to the true Ampulla), and essentially differ in having only three rather remote transverse striæ at each end, whereas on the latter shell there are seven or eight striæ on the lower extremity, and none on the upper."

** *Shells probably concealed, destitute of a cuticle, and under the integuments.*

180. B. *aperta.*—Shell smooth, with indistinct lines of growth; suborbicular, depressed; aperture expanded; pillar short.

Linn. Syst. i. 1183. *Pult.* Dorset. 40. *Don.* Brit. Shells, t. ccxx. *Mont.* Test. Brit. 208. vig. ii. f. 1, 3.—Not common.

Length 1 inch, breadth ¾ths, thin, pellucid, white; apex simple; body slightly involuted. Animal pellucid, white, with minute opake specks; stomach of three testaceous plates.

181. B. *punctata.*—Shell suborbicular, patulous, moniliformly striated longitudinally.

Adams, Linn. Trans. v. 2. t. i. f. 6, 8.—B. catena, *Mont.* Test. Brit. 215. t. 7. f. vii.—On the English coast, not common.

Length about ⅛th of an inch; breadth rather less; apex rounded, with a cavity exposing a volution. Montagu mentions "a variety with a more transparent zone, taking in eight or ten of the catenæ, which are more strongly defined; the rest of the shell appears as it were frosted, and not so glossy, possessing a subumbilicus; and the outer margin of the aperture, close to the body, is winged, or reflected a little, forming a depression or sulcus on that part."

182. B. *emarginata.*—Shell gibbous; aperture emarginate; pellucid, smooth; lip subarcuated.

Adams, Linn. Trans. v. 2. t. i. f. 9, 11.—On the English coast, rare.

183. B. *denticulata.*—Shell white, pellucid, oblong, nearly equal, obtuse, smooth; outer lip ending in a tooth retrally.—Perhaps only the young of B. aperta.

Adams, Linn. Trans. v. 1. t. i. f. 3, 6.—Coast of Pembroke.

184. B. *flexilis.*—Shell pellucid, horn-coloured; apex white, opake, with a single volution.

Laskey, Mont. Test. Brit. Supp. 168. Wern. Mem. i. 396. t. 8. f. 6.—Dunbar, rare.

Length half an inch, wrinkled; flexible in a moistened state; brittle when dry.—This shell probably belongs to the genus *Sigaritus.*

EXTINCT SPECIES.

1. B. *convoluta*.—Cylindrical, smooth; aperture linear, expanded a little way from the base; vertex obtuse, perforated.—*Sower.* Min. Conch. t. ccccIxiv. f. 1.—In *Crag.*

2. B. *constricta*.—Subcylindrical, contracted in the middle; vertex truncated, perforated; base obscurely striated; aperture linear, expanded at the base.—*Sower.* Min. Conch. t. ccccIxiv. f. 2.—*London clay*, Barton.

3. B. *elliptica*.—Elliptical, elongated, transversely striated; vertex perforated; aperture widest at the base.—*Sower.* Min. Conch. t. ccccIxiv. f. 6.—*London clay*, Barton.

4. B. *attenuata*.—Elliptical, transversely striated; superior portion elongated, truncated, perforated; aperture curved, widest towards the base; striæ distant in the middle.—*Sower.* Min. Conch. t. ccccIxiv. f. 3.—*London clay.* Hordwell.

5. B. *filosa*.—A fragment. "Its numerous striæ and expanded lip distinguish it from B. attenuata."—*Sower.* Min. Conch. t. ccccIxiv. f. 4.

PECTINIBRANCHIA.

CRYPTOBRANCHIA.

Heart entire, and detached from the rectum. Sexes distinct on different individuals. The shells of the female more ventricose in the body-whorl than those of the male.

a. Shell external.

b. Aperture of the shell entire, together with the anterior margin of the cloak at the entrance of the branchial cavity. HOLOSTOMATA.

c. Foot with a lid for closing the aperture of the shell. TECTIPEDA.

TURBONIDÆ. Aperture of the shell ovate or round.

NERITADÆ. Aperture semicircular, with an oblique straight pillar-lip.

TROCHUSIDÆ. Aperture subquadrangular.

cc. Foot destitute of a lid. NUDIPEDA.
Janthina.
Velutina.

bb. Aperture of the shell canaliculated, for the reception of the syphon of the branchial cavity. SOLENOSTOMATA.

aa. Shell internal.
Sigaretus.

HOLOSTOMATA.

TURBONIDÆ.

* *Marine.*

- *a.* Aperture ovate, inner-lip formed by the body-whorl on which the peristome is spread.
  - *b.* Pillar-lip simple, or without teeth.
    - *c.* Peristome incomplete retrally.
      - Turbo.
      - Phasianella.
      - Turritella.
    - *cc.* Peristome complete retrally.
      - Cingula.
  - *bb.* Pillar-lip with a tooth.
    - Odostomia.
    - *Monodonta.*
- *aa.* Aperture circular, peristome entire, and more or less disjoined from the body-whorl.
  - *b.* Whorls with transverse ridges, the last formed one constituting a thickened margin to the mouth.
    - Scalaria.
    - Cyclostrema.
  - *bb.* Whorls destitute of the transverse ridges, forming, in succession, the peristome.
    - *c.* Shell armed with tubercles or processes.
      - Delphinula.
      - *Cirus.*
    - *cc.* Shell destitute of processes.
      - Skenea.
      - *Euomphalus.*

** *Fluviatile.*

- *a.* Peristome entire.
  - Paludina.
  - *Ampullaria.*
  - *b.* Peristome incomplete retrally.
    - *Melania.*

GEN. XLVII. TURBO.—Shell ovoid, the body-whorl occupying upwards of one-half of the length; aperture with the peristome incomplete retrally; pillar-lip flattened.

185. T. *littoreus*. Periwinkle. — Whorls five, separating line shallow; outer-lip joining the body at an acute angle.

Cochlea fusca, *List.* An. Ang. 162. Conch. 585. f. 43.—Turbo lit. *Linn.* Syst. Nat. i. 1232. *Mont.* Test. Brit. 301.—Common within tide-mark.

Length about an inch; breadth three quarters, various in colour, dusky, with lighter stripes, or with a white band, or orange-yellow; apex blunt, nearly smooth or spirally striated; animal striped with black, the tentacula annulated.—Extensively used as food. Mr Sowerby has figured a shell which he considers as identical with this species, and another similar to *T. rudis*, (Min. Conch. t. 71.), as from the *Crag* formation. We are inclined, in this instance, to suspect, that some products of a deposition of *modern marine diluvium* have been confounded with the genuine inmates of the Crag.

186. T. *petreus*.—Whorls five, conical, nearly flat; outer-lip joining the body at an acute angle, and embracing a portion of the whorl.

Helix pet. *Mont.* Test. Brit. 403.—South coast of England.

Length about $\frac{2}{10}$ths, breadth $\frac{1}{10}$th of an inch, of a dark brown colour; destitute of spiral striæ, but is marked transversely by irregular minute lines of growth; pillar-lip remarkably broad, grooved anteally; outer-lip thin; body-lip slightly convex.—This species, according to Montagu, lives on the rocks a little below high water-mark.

187. T. *rudis*.—Whorls five, rounded; outer-lip thick, joining the body nearly at right angles.

Maton, Don. Brit. Shells, t. xxxiii. *Mont.* Test. Brit. 304.—T. jugosus, ib. 586. *Maton* and *Rackett*, Linn. Trans. viii. 158.—Common.

Length and breadth nearly equal; colour yellowish or brown; separating line deep. The surface of the whorls is, in some individuals, nearly smooth, except by the markings of the lines of growth, constituting the *T. rudis*; while, in others, the surface is grooved by spiral lines, the intermediate spaces flat or sharp edged, becoming the *T. jugosus*. The colours of the animal are usually plain.—The form and mode of junction of the outer-lip with the body seem the distinguishing features of the species.

188. T. *tenebrosus*.—Whorls five, rounded; outer-lip thin, joining the body-whorl nearly at right angles.

Mont. Test. Brit. 303. *Turt.* Conch. Dict. 197.—On the English and Irish coasts.

Length $\frac{6}{8}$ths, breadth $\frac{5}{8}$ths; separating line distinct; colour dark purple, with yellowish spiral bands; lines of growth minute, finely or coarsely striated spirally.—This species is found on mud near high water-mark, and in brackish marshes.

189. T. *fabalis*.—" Subglobular, very obtuse, smooth, with three hardly produced volutions, of a chesnut colour, with obscure pale bands; pillar and throat chesnut."

Turton, Zool. Journ. ii. 366. t. xii. f. 10.—On the rocks at Scarborough, Mr Bean.

Length about $\frac{1}{8}$th of an inch; bands about twelve, apparently interrupted, so as to give the surface a checkered appearance; finely striated spirally.—Probably the fry of the preceding species.

190. T. *mammillatus.*—Whorls five, slightly rounded; spirally striated with raised dots.

Don. Brit. Shells, t. clxxiii.—Scilly Rocks.

Length and breadth nearly equal; aperture rounded, a few ridges of larger dots give to the whorls a subangulated form. According to a memorandum in the handwriting of Da Costa, annexed to one of the specimens figured by Donovan, this shell has been found by Mr Platt on the Scilly Rocks.

191. T. *crassior.*—Shell conical, yellowish-white, with five rounded and deeply divided whorls.

Turbo lævis, quinque anfractibus apertura subrotunda marginata, *Walk.* Test. Min. 10. t. ii. f. 34.—T. crass. *Mont.* Test. Brit. 309. t. xx. f. 1. —T. pallidus, *Don.* Brit. Shells, t. clxxviii. f. 4.—Common in deep water.

Length half an inch; breadth $\frac{3}{10}$ths; covered with a pale epidermis, which rises in numerous sharp oblique ridges, beneath which are a few obsolete spiral striæ. The whorls are sometimes slightly flattened in the middle; they are thick and opake. Pillar-lip flattened anteally; outer-lip thin, joining the body-whorl nearly at right angles.

192. T. *quadrifasciatus.*—Pillar with a groove, ending retrally in a perforation. Shell striated spirally.

Mont. Test. Brit. 328. t. xx. f. 7.—T. vinctus, *ib.* 307. t. xx. f. 3.—T. canalis, *ib.* 309.—Among sea-weeds, a little beyond low water-mark, common.

Length from three to five-tenths of an inch, glossy, of a yellowish horn-colour, with four dark spiral bands on the body, two of which enter the aperture, and two are external; between these pairs there is usually a whitish band, where the whorl bends in, rather suddenly, towards the pillar; the outer-lip, at its junction with the whorl, covers a portion of this white space, the external part, however, is usually exposed, and appears as a white band along the line of separation; the whorls are more or less rounded, and subcarinated on the body-whorl; but in all, the surface is marked by waved spiral striæ, slightly decussated by the lines of growth. The outer-lip, when young, is thin; but towards maturity it becomes thick, sloping outwardly to a sharp edge; operculum membranaceous, smooth, yellowish.

193. T. *decussatus.*—Whorls five, rounded; strongly striated transversely; finely striated spirally.

Mont. Test. Brit. 322. t. xii. f. 4.—Among shell-sand, rare.

Length about the eighth of an inch, breadth one-half less; white, glossy; apex rather blunt; aperture suboval, a little contracted retrally.

194. T. *margarita.*—Whorls four, the first very large, pillar-cavity wide; inside of the aperture with a mother-of-pearl gloss.

Helix Marg. *Laskey*, *Mont.* Test. Brit. Supp. 143. Wern. Mem. i. 408. t. viii. f. 5.—Common on fuci.

Breadth and height about one-eighth of an inch; smooth glossy, greenish; sometimes with one spiral rufous band; when bleached, it is of a brownish-white colour; whorls increase rapidly; rounded, the spire short and blunt; aperture suborbicular, the outer-lip thin and prominent, retrally, where it joins the body-whorl nearly at right angles; pillar-lip reflected, forming the cavity behind; operculum finely striated spirally. We have little doubt in considering the *Helix fulgidus* of Adams (Linn. Trans. iii. 254.), and the *Turbo fulgidus* of Montagu, as the fry of this very common species.

195. T. *nivosus*.—Whorls five, smooth, rounded, slender, tapering to an obtuse point.

Mont. Test. Brit. 326.—Coast of Devon, rare.

Length about a line; breadth two-thirds less. Whorls with the separating line deep; aperture suboval; inner-lip and pillar quite smooth and even; without cavity.

The history of the remaining recent species is involved in obscurity, but their characters are subjoined, according to the best information in my possession.

* * *

196. T. *strigatus*.—Shell white, whorls three, with three spiral ridges on the larger volution.—*Walk.* Test. Min. 11. t. ii. f. 38.—Sea-salter.

197. T. *scriptus*.—Whorls three, smooth, marked with brown, letter-like lines: aperture suborbicular.—*Adams*, Linn. Trans. iii. 65. t. xiii. f. 11-12. —Coast of Pembrokeshire.

198. T. *subrufus*.—Smooth, opake, dull red, the upper part of each spire marked with a white spiral band; whorls five, somewhat angular above.—*Adams*, Linn. Trans. v. iii. t. i. f. 18-19.—Pembrokeshire.

199. T. *canaliculatus*.—Pellucid, whitish; the whorls five, fluted across, and separated by an elevated line.—*Adams*, Linn. Trans. iii. 253.—Coast of Pembrokeshire.

200. T. *resupinatus*.—Semipellucid, glossy, horn-coloured; aperture large, the whorls at the tip turned backwards.—Helix, *Walk.* Test. Min. 1. t. i. f. 24.—Sandwich, very rare.

201. T. *globosus*.—White, opake, glossy, smooth, globose; whorls two; aperture roundish.—Helix. *Walk.* Test. Min. 1. t. i. f. 25.—Sandwich, not common.

202. T. *reticulatus*.—White, subpellucid; one whorl; reticulated; a slight pillar-cavity; aperture round.—Helix, *Walk.* Test. Min. 1. t. i. f. 26.—Reculvir, rare.

203. T. *striatus*.—Greenish-white, pellucid; whorls striated, reflected on the back; aperture oval.—Helix, *Walk.* Test. Min. 8. t. i. f. 29.—Sandwich, rare.

204. T. *coarctatus*.—White, pellucid; whorls two; aperture roundish, contracted near the pillar-cavity.—Helix, *Walk.* Test. Min. 8. t. i. f. 30.—Sandwich, not common. This is considered by Montagu (Test. Brit. 445.), as the fry of a Helix.

205. T. *fasciatus*.—White, pellucid, smooth; whorls three, the first tumid, and marked with three spiral belts, of a rich marone colour, the middle one broad, the lateral ones narrow; aperture large, a slight pillar-cavity.—Helix fas. *Adams*, Linn. Trans. v. 3. t. i. f. 20-21.—Tenbigh.

206. T. *nitidissimus*.—Corneous, pellucid, glossy; whorls two, finely striated across; with a pillar-cavity.—Helix nit. *Adams*, Linn. Trans. v. 4. t. i. f. 22, 23, 24.

207. T. *bicolor.*—Smooth, dull, inside white; whorls two; pillar-cavity indistinct.—Helix bicolor, *Adams*, Linn. Trans. v. 4. t. i. f. 25, 26, 27.—Tenbigh.

208. T. *variegatus.*—Subpellucid, smooth; whorls four, the first ventricose, with red lines; margin of the aperture very much spread; no pillar-cavity.—Helix var. *Adams*, Linn. Trans. iii. 67.—Coast of Pembrokeshire.

209. T. *tubulatus.*—Whorls three, striated; pillar-cavity produced into a marginated tube. Helix tub. *Adams*, Linn. Trans. iii. 67.—Coast of Pembrokeshire.

EXTINCT SPECIES. (TURBO.)

1. T. *ornatus.*—Conical, spirally striated; three or four tuberculated ridges run along each whorl, the middle one the largest.—*Sower.* Min. Conch. t. ccxl. f. 1, 2.—In *Lower Oolite*, Dundry.

2. T. *carinatus.*—Conical, with five or six spiral crenulated ridges; whorls carinated.—*Sower.* Min. Conch, t. ccxl. f. 3.—In *Green Sand.*

3. T. *moniliformis.*—Short, conical, spirally striated; whorls separated above by a canal, their edges granulated; pillar-cavity large, wrinkled.—*Sower.* Min. Conch. t. cccxcv. f. 1.—In *Green Sand*, Blackdown. Probably not of this genus.

4. T. *sulcatus.*—Conical, sulcated spirally, striated transversely; whorls rounded, separated above by a canal; pillar-cavity small; aperture sulcated within.—*Pilkington*, Linn. Trans. vii. 118. t. xi. f. 9.—T. sculptus, *Sower.* Min. Conch. t. cccxcv. f. 2.—In *London Clay.*

5. T. *conicus.*—Ovato-conical, acute, whorls very convex, spirally striated; with a pillar-cavity.—*Sower.* Min. Conch. t. ccccxxxiii. f. 1.—In *Green Sand*, Blackdown.

6. T. *rotundatus.*—Ovate, subglobose, pointed, smooth; aperture rather longer than wide, pointed retrally.—*Sower.* Min. Conch. t. ccccxxxiii. f. 2.—In *Green Sand*, Blackdown.

GEN. XLVIII. PHASIANELLA.—Shell conical; aperture lengthened, contracted by the projection of the body-whorl; peristome incomplete retrally; pillar-lip smooth, nearly straight.

210. P. *polita.*—Whorls nine or more, conical, strong, flat, smooth, closely united.

Helix pol. *Pult.* Dorset, p. 49. *Mont.* Test. Brit. 398.—Turbo albus, *Don.* Brit. Shells, t. clxxvii.—On the English shores.

Length $\frac{5}{8}$ths of an inch, breadth $\frac{2}{10}$ths; aperture oval, contracted retrally by the body-whorl.

211. P. *subulata.*—Whorls about ten, subulate; with two spiral brown bands along the separating line.

Turbo sub. *Don.* Brit. Shells, t. clxxii.—Helix sub. *Mont.* Test. Brit. Sup. 142.—On the English and Scottish coast, not common.

Length about three quarters of an inch; smooth, glossy, white; the two bands are on the retral edge of the nearly obsolete line of separation; whorls nearly flat; aperture lengthened, rounded anteally, contracted retrally; outer-lip nearly straight.

212. P. *decussata.*—Whorls eight or nine, strongly striated transversely; minutely striated spirally.

Helix dec. *Mont.* Test. Brit. 399. t. xv. f. 1.—On the shore at Weymouth, Mr Bryer.

Length $\frac{3}{10}$ths of an inch; breadth $\frac{1}{10}$th; white, slender; whorls nearly flat, the separating line extremely fine; aperture narrow, suboval, contracted at both ends; outer-lip somewhat expanded, and a little thickened at the back; inner lip slightly replicated.

213. P. *pallida.*—Whorls six or seven, smooth; outer-lip arcuated.

Turbo pal. *Mont.* Test. Brit. 325. t. xxi. f. 4.—In sand, Salcomb Bay.

Length $\frac{1}{8}$th of an inch; breadth $\frac{2}{3}$ds less; slender, tapering to a fine point; whorls separated by a well-defined line; aperture suborbicular, a faint duplicature on the pillar-lip, forming behind a small cavity.

In the Mineral Conchology, the following fossil shells are referred to the genus, though it is more probable that they belong to Limnea or Paludina.

1. P. *orbicularis.*—Conical, acute, smooth; whorls about six, ventricose; aperture nearly round.—*Sower.* Min. Conch. t. clxxv. f. 1.—*Fresh water Limestone*, Shalcomb, Isle of Wight.

2. P. *angulosa.*—Conical, smooth; whorls subcarinated; aperture nearly round.—*Sower.* Min. Conch. t. clxxv. f. 2.—Along with the last.

3. P. *minuta.*—Elongated, smooth; whorls five or six; obscurely squared; aperture oblong.—*Sower.* Min. Conch. t. clxxv. f. 3.—Along with the last.

Gen. XLIX. TURRITELLA.—Shell elongated; the whorls numerous, produced; aperture wide; the pillar-lip slightly rounded.

214. T. *terebra.*—Whorls about sixteen, with numerous spiral ridges.

Buccinum tenue, *List.* An. Ang. 161. Conch. t. dxci. f. 57. Turbo Ter. *Linn.* S. Syst. i. 1239. *Penn.* Brit. Zool. iv. 130. t. lxxxi. f. 113. *Mont.* Test. Brit. 293.—Common.

Length sometimes exceeding two inches; breadth of the body-whorl half an inch, of a reddish or purplish brown; whorls sometimes eighteen in number, ending in a fine point; the larger whorls rounded, with five or six prominent ridges, besides smaller ones, crossed by the layers of growth. In the young shells the ridges are less numerous, and the anteal edge of the body-whorl is flattened. The aperture, in young shells, is subquadrangular; in an old specimen the outer lip is round and thin, and the pillar-lip nearly straight. The animal is yellow, striped with dusky, with the tentacula short.—This species resides in deep water, but is frequently thrown ashore after storms.

215. T. *exoleta.*—Whorls about twelve, spirally striated, with two broad rounded spiral ridges.

Cochlea variegata, *List.* Conch. t. dxci. f. 58.—Turbo exol. *Linn.* Syst. i. 1239.—Turbo cinctus, *Don.* Brit. Shells, t. xxii. f. 1. *Mont.* Test. Brit. 295.—On the English coast, rare.

Length 2½ inches; white. purple, or variegated with brown; whorls raised, deeply divided by the separating line. Lister seems to have been acquainted with this shell as British; afterwards Da Costa obtained it from the coasts of Lincoln and Lancashire; Montagu received it from Kent.

216. T. *duplicata.*—Whorls about fourteen, and spirally striated, with two acute spiral ridges.

Buccinum crassum, *List.* An. Ang. 160. t. iii. f. 7. Conch. t. DXCI. 59.—Turbo dup. *Linn.* Syst. i. 1239. *Penn.* Brit. Zool. iv. 129. t. LXXXI. f. 112. *Don.* Brit. Shells, t. cxii. *Turton*, Conch. Dict. 216.—English coast, rare.

Length about 2½ inches, thick, heavy, of a brownish colour; the two ridges are of unequal size.—This species was obtained by Lister from the Scarborough fishermen; and Dr Turton announces that it was "said to have been lately discovered on the western coasts by Dr Leach."

217. T. *subtruncata.*—Whorls about seven, rounded, and obscurely striated spirally.

Turbo sub. *Mont.* Test. Brit. 300. t. x. f. 1.—In sand, rare.

Length about $\frac{2}{10}$ths of an inch; white; whorls from five to seven, and (in a specimen in my possession) gradually tapering to an obtuse point; outer lip rounded; pillar-lip nearly straight, a little reflected, so as to form a small cavity behind.

218. T. *elegantissima.*—Whorls about ten, flat, with numerous regular transverse grooves.

Turbo turritus novem anfractibus striatis apertura rotunda, *Walk.* Test. Min. ii. t. ii. f. 39.—Turbo eleg. *Mont.* Test. Brit. 298. t. x. f. 2.—In deep water, not common.

Length about $\frac{3}{10}$ths of an inch, breadth about $\frac{1}{5}$th of its length; colour of the shell white, glossy; of the epidermis brown; ridges and grooves rounded, slightly oblique, separating line distinct; outer lip slightly rounded; pillar-lip nearly straight, thick, forming a slight angle anteally. It is a very strong shell in proportion to its size.

219. T. *truncata.*—Whorls four or five, flat, decreasing suddenly; apex abrupt.

Turbo trun. *Mont.* Test. Brit. 300. t. x. f. 7.—Common.

Length about $\frac{2}{10}$ths of an inch; white, glossy; whorls nearly six in number, deeply divided by the separating line, and faintly striated transversely; aperture ovate; pillar-lip slightly rounded, and a little reflected.

220. T. *unica.*—Whorls nine, finely striated spirally, with numerous undulated transverse ridges.

Turbo turritus septem anfractibus strigatis apertura ovali, *Walk.* Test. Min. ii. t. ii. f. 40.—Turbo unicus, *Mont.* Test. Brit. 299. t. xii. f. 2.—Among shell-sand, rare.

Length about $\frac{2}{10}$ths of an inch; white, glossy, slender; whorls rounded and deeply divided by the separating line; aperture ovate; the pillar-lip rounded.

221. T. *simillima.*—Whorls eight, with fourteen distant ridges parallel with the axis of the shell.

Laskey, Mont. Test. Brit. Supp. 136. Wern. Mem. i. 406. t. viii. f. 15. —Shores of Jura.

Length $\frac{3}{8}$ths of an inch; white, slender; whorls slightly elevated; the spaces occupied by the depressions larger than those of the ridges; aperture subovate.

222. T. *nitidissima*.—Whorls nine, rounded, smooth.

Turbo nit. *Mont.* Test. Brit. 299. t. xii. f. 1.—Among fine sand, rare.

Length $\frac{1}{8}$th of an inch; slender, pointed; brownish-white, glossy; whorls much rounded and oblique; aperture ovate, pillar-lip rounded.

223. T. *indistincta*.—Whorls eight, flattened, ribbed transversely, striated spirally.

Turbo ind. *Mont.* Test. Brit. Supp. 129.—English and Scottish shores, rare.

Length nearly $\frac{3}{10}$ths of an inch; breadth less than $\frac{1}{10}$th; colour brown, with darker spiral bands, glossy; separating line deep; transverse ridges numerous, rounded, waved, wanting on the lower part of the body-whorl, where the spiral striæ are most conspicuous; these last do not cross the ridges, but merely occupy, though faintly, the furrows. Montagu described this beautiful species from the Boysian cabinet. I obtained my specimen, which is quite fresh, from Loch Broom.

224. T. *carinatula*.—Whorls seven to ten, bent towards the apex, with numerous transverse ribs, with a contracted marginated aperture.

Turbo turritus carinatus, *Walk.* Test. Min. 12. t. xi. f. 44.—T. subarcuatus, *Adams*, Linn. Trans. iii. 66. t. xiii. f. 27–28.—On the English coast.—An obscure species.

◆

EXTINCT SPECIES.

1. T. *conoidea*.—Whorls about eighteen, lower part of each angular, slightly projecting, longitudinal striæ equally distant, seven or more, with intermediate smaller ones, all acutely crenulated.—*Sower.* Min. Conch. t. xli. f, 1. 4.—In *London clay*.

2. T. *elongata*.—Whorls about fifteen, flattened in the middle, lower parts projecting; striæ more distant near the middle of the whorls, inconspicuously crenulated, with some finer intervening striæ.—*Sower.* Min. Conch. t. xli. f. 2.—In *London clay*.

3. T. *brevis*.—Whorls about twelve; spire rather short; upper and lower parts of the whorls equally rounded; striæ ten or twelve, finely crenulated.—*Sower.* Min. Conch. t. xli. f. 3.—In *London clay*.

4. T. *incrassata*.—Whorls about fourteen, flattish, with the lower part angular, and three smooth longitudinal threads; outer lip thickened in the middle.—In *Crag*, Holywell.

5. T. *edita*.—Whorls about twenty, rounded, slightly depressed in the middle; lower parts rather prominent, with many obscure longitudinal striæ. (Brander, Foss. t. iii. f. 48.) *Sower.* Min. Conch. t. xli f. 7.—In *London clay*.

6. T. *muricata*.—Whorls flattened on the upper side; spirally striated, with transverse ribs rising into small spires at the outer sections.—*Sower.* Min. Conch. t. ccccxcix. f. 1–2.—In *Coral Rag*, Steeple Ashton, and Robin Hood's Bay.

7. T. *cingenda*.—Whorls with a round crenated band upon the lower edge; spirally striated; the upper whorl with transverse ribs.—*Sower.* Min. Conch. 1. t. xcix. f. 3.—In shale with the last, Robin Hood's Bay, near Scarborough.

8. T. *Urii.*—Elongated, striated transversely. Ure's Hist. Ruth. 308. t. xiv. f. 7.—*Limestone of the Coal Formation.*

9. T. *elongata.*—Elongated, striated spirally. Ure's Hist. Ruth. 308. t. xiv. f. 11.

10. T. *constricta.*—Turrited, smooth; whorls eight or ten; convex below, contracted above, with an adpressed crenated margin. Turbo con. Mart. Derb. t. xxxviii. f. 3.—Melania con. *Sower.* Min. Conch. t. ccxviii. f. 2.—*Carboniferous Limestone.*

GEN. L. CINGULA.—Aperture of the shell with the peristome complete, being united retrally.

* *Outer lip thickened by a rib.*

225. C. *cimex.*—Whorls four, strong; ribbed coarsely, transversely and spirally.

Turbo cim. *Linn.* Syst. Nat. i. 1233. *Don.* Brit. Shells, t. ii. f. 1. *Mont.* Test. Brit. 315.—Southern coasts, not common.

Length about $\frac{1}{8}$th of an inch; white; whorls with the separating line deep and ragged; meshes of the ribs forming quadrangular pits, in six rows on the body-whorl, and two on the second.

226. C. *subcarinata.*—Whorls three, little produced, with three spiral ridges, and numerous transverse striæ.

Helix sub. *Mont.* Test. Brit. 438. t. vii. f. 9.—Trochus rugosus, *Brown*, Wern. Mem. ii. 520. t. xxiv. f. 5.—Coasts of England and Ireland.

Breadth about $\frac{1}{10}$th of an inch, depressed; glossy, frosted; two of the spiral lines are on the lower part of the body-whorl, and one on the upper; pillar-cavity wide and deep; aperture oval.

227. C. *calathisca.*—Whorls six, with numerous transverse and spiral ribs.

Turbo cal. *Laskey*, Mont. Test. Brit. Supp. 132. t. xxx. f. 5.—West coast of Scotland and England, rare.

Length $\frac{1}{4}$th of an inch; brown; conical; the pits formed by the intersection of the ribs are more numerous than the last, being in eight rows on the body-whorl, and four on the next; aperture with the outer lip denticulated within.

228. C. *striatula.*—Whorls five, spirally ribbed, longitudinally striated, each terminating in a flat top.

Turbo stri. *Mont.* Test. Brit. 306. t. x. f. 5.—Turbo monilis, *Turton*, Conch. Dict. 200.—On the English coast, rare.

Length $\frac{2}{10}$ths of an inch; ovate, obtuse, white; whorls with fine spiral striæ, which, towards the upper part of each volution, rise into three membranaceous ridges; those near the pillar are likewise elevated and strong; the transverse striæ are numerous, but principally obvious in the furrows, yet giving to the shell a pretty cancellated appearance; aperture suborbicular, angulated at the upper part.

229. C. *costata.*—Whorls five, spirally striated, and transversely ribbed; a groove behind the outer lip, extending behind the pillar to the aperture.

Turbo crassus, clathratus, quinque anfractibus apertura rotunda marginata, *Walk.* Test. Min. 13. t. ii. f. 47.—T. cost. *Adams*, Linn. Trans. iii. 65. t. xiii. f. 13–14. *Mont.* Test. Brit. 311. t. x. f. 6.—Common on the English shores, on fuci; rare in Scotland.

Length $\frac{2}{10}$ths of an inch; breadth about $\frac{1}{20}$th; white, glossy; whorls a little rounded; the ribs are strong, slightly waved; on the body-whorl they end in a strong spiral rib, which extends from the body-lip, behind the pillar, to the outer lip; this spiral rib is followed by a groove; the spiral striæ are most conspicuous between the ribs.

230. C. *parva.*—Whorls five, strong, with transverse ribs, without spiral striæ.

T. quinque anfractibus subcarinatis apice purpureo apertura ovali, *Walk.* Test. Min. 12. t. ii. f. 43.—T. lacteus, *Don.* Brit. Shells, t. xc.—T. parvus, *Mont.* Test. Brit. 310.—Among fuci, common.

Length upwards of $\frac{1}{8}$th of an inch, conical; white, brown, or tinged with purple; whorls rounded, with about twelve obtuse ribs, sometimes reaching to the pillar, or only to the middle of the body-whorl; aperture slightly ovate. Montagu, in his account of this species, refers to the *Turbo aëreus* and *T. subluteus* of *Adams*, Linn. Trans. iii. 65.

231. C. *marginata.*—Shell subcylindrical; whorls six, finely striated spirally, with about six transverse ribs.

Laskey, Mont. Test. Brit. Supp. 128. Wern. Mem. i. 406. t. viii. f. 13. —Hitherto found only at Guernsey and Dunbar.

Length $\frac{3}{8}$ths of an inch; breadth $\frac{3}{4}$ths less; white; very strong, the ribs gradually becoming obsolete at the line of separation; aperture patulous.

232. C. *reticulata.*—Shell conical, having six, rounded, regularly reticulated spires, with a slight pillar-cavity.

T. subumbilicatus quatuor anfractibus reticulatus, apertura subrotunda, *Walk.* Test. 9. t. ii. f. 32.—T. ret. *Mont.* Test. Brit. 322. t. xxi. f. 1. —Among shell-sand, rare.

Length about $\frac{1}{10}$th of an inch; breadth $\frac{1}{20}$th; white or brown; aperture suborbicular; the transverse striæ do not appear on the lower part of the body-whorl, where the spiral striæ are most conspicuous. The *Turbo punctura* of Montagu, *Test. Brit.* 320. t. xii. f. 2. appears to be the young of this species, or before the rib of the lip is formed; the same also as *Turbo retiformis*, *Walk.* Test. Min. 20. t. ii. f. 37.

233. C. *conifera.* — Shell conical; whorls six, with about twelve transverse undulated ribs; the interstices at the top of the whorls formed into small cavities.

T. con. *Mont.* Test. Brit. 314. t. xv. f. 2.—Found by *Mr Bryer*, at Weymouth, rare.

Length $\frac{1}{4}$th of an inch; breadth $\frac{2}{3}$ds less; white; the cavities of the top of the spires give the separating line a denticulated appearance; the spiral striæ are numerous and fine; aperture oval, oblique, strongly marginated.

234. C. *denticulata.* — Shell conical; whorls six, with ten transverse straight ribs projecting at the top of each.

Turbo dent. *Mont.* 315.—Weymouth, *Mr Bryer.*—St Andrew's, *Miss Lambert.*

Length about $\frac{1}{4}$th of an inch; breadth about one-half less; white, subpellucid; no spiral striæ; the ribs join the pillar-lip, covering the whole body-whorl; aperture suborbicular; pillar-lip with one or two tubercles at the base, adjoining the ribs.

235. C. *semicostata.*—Shell short, conical; whorls five, spirally striated, with abbreviated transverse ribs.

Turbo elegans, *Adams*, Linn. Trans. iii. 66. t. xiii. f. 31–32.—T. sem. *Mont.* Test. 326. t. xxi. f. 5.—Coast of Devon and Dunbar.

Length half a line; white; whorls rounded, well defined by the separating line; neither the striæ nor ribs conspicuous on the upper whorls; the ribs do not extend to the lower part of the body-whorl, where the spiral striæ are most conspicuous; aperture suborbicular; pillar-lip a little reflected.

236. C. *Bryerea.*—Shell conical; whorls seven, with about eighteen transverse ribs; destitute of spiral striæ.

Turbo B. *Mont.* Test. Brit. 313. t. xv. f. 8.—In shell-sand, rare.

Length about $\frac{1}{4}$th of an inch; white, glossy; whorls rounded, well defined by the line of separation, which scarcely interrupts the ribs; aperture oval, patulous; pillar-lip slightly reflected.

237. C. *striata.*—Whorls six, rounded, regularly striated spirally, with transverse obsolete ribs at the top of each volution.

Turbo sex anfractibus reticulatis apertura ovali submarginata, *Walk.* Test. Min. 13. t. ii. f. 49.—T. striatus, *Adams*, Linn. Trans. iii. 66. *Mont.* Test. Brit. 312.—Among sea-weeds, common.

Length upwards of $\frac{1}{8}$th of an inch; cuticle brownish; whorls with a deep separating line; aperture oval, narrow retrally; outer lip slightly thickened.

238. C. *disjuncta.*—Whorls six, smooth; with the deep line of separation flat or concave.

Turbo dis. *Laskey*, Mont. Test. Brit. Supp. 128. Wern. Mem. i. 405. t. viii. f. 3.—Belton Sands, Dunbar.

Length about $\frac{1}{4}$th of an inch, slender, white; whorls much rounded, divided by a broad and deep line of separation; aperture nearly orbicular; pillar-lip reflected, forming a small cavity.

** *Outer lip not thickened by a rib.*

239. C. *labiosa.*—Whorls seven; the three largest faintly ribbed transversely; aperture patulous.

Turbo lab. *Mont.* Test. Brit. 400. t. xiii. f. 7.—T. membranaceus, *Adams*, Linn. Trans. v. ii. t. i. f. 14–15.—English coast, not uncommon; rare in Scotland.

Length about $\frac{4}{10}$ths; breadth less than $\frac{2}{10}$ths; subpellucid, horn-coloured; whorls but little raised, the upper ones smooth, the under ones with about fifteen faint ribs; aperture oval, with the outer lip thin; the pillar-lip much reflected, forming a cavity behind.—This shell varies much in its thickness, and in the disposition or presence of the ribs.

240. C. *ventricosa.*—Whorls six, tumid, smooth and glossy.

T. quinque anfractibus ventricosis apertura subrotunda, *Walk.* Test. Min. 10. t. ii. f. 36.—T. vent. *Mont.* Test. Brit. 317. t. xii. f. 13.—English coast, common.

Length $\frac{1}{8}$th of an inch; breadth $\frac{2}{3}$ds less, of a horn colour, with minute lines of growth; aperture suborbicular; pillar-lip reflected, forming, behind, a small cavity; lid thin, wrinkled, and corneous.

241. C. *auricularis.*—Whorls five, rounded; aperture ear-shaped; inner lip with an angle.

Turbo aur. *Mont.* Test. Brit. 308.—Near Southampton, rare.

Length $\frac{3}{8}$ths of an inch; breadth about $\frac{2}{8}$ths; conic, smooth, subpellucid, horn-coloured; whorls deeply divided by the separating line; apex moderately pointed; inner lip forming an angle about the middle, behind which is a narrow cavity. Montagu compares this species to *Limnea fossaria*, to which, it may be added, some of the numerous varieties of *Turbo quadrifasciatus* bear a close resemblance, and with which the present species is probably connected.

242. C. *pulla*.—Whorls five, rounded, the first large; striated or spotted with pink.

Turbo pullus, *Linn.* Syst. i. 1233. *Don.* Brit. Shells, t. ii. f. 2–6. *Mont.* Test. Brit. 319.—On fuci, on the English and Irish coasts.

Length $\frac{3}{8}$ths of an inch; breadth one-half less, smooth, glossy, finely variegated with pink, purple, or brown; strong; whorls decreasing rapidly, deeply divided by the separating line; aperture suborbicular; pillar-lip reflected, and forming behind a small cavity; operculum strong, thick, testaceous, very convex, white and smooth externally; the interior part, when separated from the animal, is a little concave, and has a small and singular spiral turn near one end.

243. C. *ulvæ*.—Whorls five to seven, nearly flat; outer lip even retrally.

Turbo ulvæ, *Penn.* Brit. Zool. iv. 132. t. lxxxvi. f. 120. *Mont.* Test. Brit. 313.—In muddy inlets, common.

Length $\frac{2}{8}$ths, breadth $\frac{1}{8}$th of an inch; corneous, thick, opake; whorls with a distinct separating line, and slightly wrinkled across by lines of growth; outer lip nearly straight retrally; pillar-lip reflected and forming behind a slight longitudinal cavity; operculum radiated with arched striæ from the inner margin.

244. C. *subumbilicata*.—Whorls five to seven, rounded, the first occupying above half the length of the shell.

Turbo sub. *Mont.* Test. Brit. 316.—About the roots of fuci, common.

Length $\frac{3}{10}$ths, breadth $\frac{1}{10}$th of an inch; greenish-grey, smooth, glossy; whorls well defined by the separating line; apex obtuse; aperture suborbicular, the outer lip rounded; the pillar-lip reflected, forming behind a small cavity.

245. C. *interrupta*.—Whorls five or six, slightly rounded, with interrupted spiral brown bands.

Turbo in. *Adams*, Linn. Trans. v. 3. t. i. f. 16, 17. *Mont.* Test. Brit. 329.—On fuci, common.

Length about $\frac{1}{8}$th of an inch; breadth $\frac{2}{3}$ds less; pellucid, glossy, pale brown; the coloured bands frequently form rows of oblong spots; aperture wide; outer lip rounded, very thin; pillar-lip scarcely reflected.

246. C. *rubra*.—Whorls five, rounded, translucent, glossy, brown, with a fine separating line.

Turbo ruber, *Adams*, Linn. Trans. iii. 66. t. xiii. f. 21. *Mont.* Test. Brit. 320.—At the roots of fuci, not uncommon.

Length $\frac{1}{8}$th of an inch; breadth $\frac{2}{3}$ds less; the pillar distinctly visible from the outside; aperture suborbicular; pillar-lip slightly reflected.

247. C. *vitrea*.—Whorls four, rounded, nearly transparent, white.

Turbo vit. *Mont.* Test. Brit. 321. t. xii. f. 3.—In Cornwall and Zetland, rare.

Length $\frac{1}{8}$th of an inch; breadth $\frac{3}{4}$ths less; smooth, glossy, subcylindric; separating line deep and oblique; aperture large; outer lip rounded, slightly compressed in the middle; pillar-lip a little reflected, forming behind a small cavity.—This seems a rare shell. Two examples occurred to me among sand from Bressay, Zetland.

248. C. *unifasciata.*—Whorls five, smooth, white, with one or two spiral bands of purplish brown.

Turbo uni. *Mont.* Test. Brit. 327. t. xx. f. 6.—On the English coast, rare.

Length about $\frac{1}{8}$th of an inch; breadth about one-half less; conical, thick; whorls little raised, divided by a small line; aperture wide; outer lip slightly reflected.

249. C. *cingilla.*—Whorls six, slightly raised, spirally striated; the separating line deep.

Turbo trifasciatus, *Adams*, Linn. Trans. v. ii. t. i. f. 12. B—T. cing. *Mont.* Test. Brit. 328. t. xii. f. 7.--T. vittatus, *Don.* Brit. Shells, t. clxxviii. f. 1.—T. graphicus, *Turton*, Conch. Dict. 200. f. 34. *Brown*, Wern. Mem. ii. 521. t. xxiv. f. 6.—Among the roots of fuci.

Length $\frac{1}{8}$th of an inch, breadth $\frac{2}{3}$ds less; subpellucid; with alternate spiral bands of horn-colour and chesnut-brown, becoming obsolete towards the apex; the separating line appears deep, in consequence of the upper margin of each volution suddenly bending inwards; aperture oval; outer lip nearly straight retrally.

250. C. *alba.*—Whorls six, smooth, with about sixteen transverse ribs on the body-whorls.

Turbo albus, *Adams*, Linn. Trans. iii. 66. t. xiii. f. 17, 18.—Roots of fuci, common.

Length about $\frac{1}{10}$th of an inch, breadth one-half less; smooth, glossy, subpellucid, pale brown, when recent, or with spiral brown bands; whorls not much rounded, smooth, glossy; the ribs, which are rounded and slightly waved, sometimes do not reach even to the body-whorl; the shell then appearing not unlike C. interrupta; aperture suborbicular; pillar-lip a little reflected.—This species has probably been confounded with C. parva, to which it bears a considerable resemblance. It is, however, more rounded in the aperture, and produced in the spire, and the outer lip is thin.

251. C. *semistriata.*—Whorls five or six, rounded, smooth in the middle, and spirally striated on both sides.

Turbo semi. *Mont.* Test. Brit. Sup. 136.—South coast of Devon.

Length $\frac{1}{8}$th of an inch; breadth one-half less, conical; apex obtuse; white; whorls well defined by the separating line; the striæ extend to the body-whorl, as far as the junction of the lip; aperture subovate, angulated at the retral end.

252. C. *dispar.*—Whorls four, the first large; striated spirally, wrinkled obliquely, and subcarinated at the base.

Turbo dispar, *Mont.* Linn. Trans. xi. 195. t. xiii. f. 4.—Found at Poole, by the Rev. Mr Bingley.

Length $\frac{1}{4}$th of an inch; breadth very little less; grey; upper whorls small, usually worn; aperture suborbicular, within of a dark purple, with one pale band near the lower extremity.—The opinion expressed by Dr Turton, that the Turbo Ziczac of Maton and Rackett, *Linn.* Trans. viii. 160. t. iv. f. 14, found near Sunderland by Lady Wilson, is probably similar to this species, may be regarded as correct.

GEN. LI. ODOSTOMIA.—Shell conical; aperture ovate; peristome incomplete retrally, and furnished with a tooth on the pillar.

253. O. *unidentata.* — Shell smooth, whorls five, slightly rounded, subpellucid.

Turbo un. *Mont.* Test. Brit. 324. t. xxi. f. 2.—From deep water, not common.

Length $\frac{1}{8}$th of an inch; breadth $\frac{2}{3}$ds less; white, glossy, delicate; separating line distinct; apex blunt; aperture ovate, a little expanded anteally; pillar-lip slightly reflected, ending retrally in a small tooth.

254. O. *plicata.*—Shell smooth; whorls seven, nearly flat.

Turbo plicatus, *Mont.* Test. Brit. 325.—In deep water, not common.

Length $\frac{2}{10}$ths of an inch; breadth less than $\frac{1}{10}$th; white, opaque, solid; separating line distinct; aperture ovate; the outer lip nearly straight retrally; pillar-lip reflected, with a cavity behind; the tooth, in the form of a ridge, near the middle of the pillar.—The descriptions of these two species have, by some accident, been intermingled in Testacea Britannica.

255. O. *spiralis.*—Whorls 5, the lower part of the largest striated spirally; the remainder of the shell ribbed transversely.

Turbo longitudinaliter striatus quinque anfractibus apertura subrotunda, *Walk.* Test. Min. 13. t. ii. f. 46.—Turbo spiralis, *Mont.* Test. Brit. 322. t. xii. f. 9.—In Salcomb Bay, and Zetland.

Length $\frac{1}{10}$th, breadth $\frac{1}{20}$th of an inch; pellucid, glossy, white; whorls nearly flat; the two upper spiral lines are the largest, join the outer lip, and are continued along the separating line; the transverse ribs are numerous, and slightly raised; aperture ovate, the outer lip nearly straight retrally; pillar lip reflected, with a slight cavity behind; the tooth or fold is minute.

256. O. *interstincta.*—Whorls 5, rather flat, and finely ribbed across.

T. int. *Mont.* Test. Brit. 324. t. xii. f. 10.—Coast of Devon, rare.

Length one line, breadth $\frac{2}{3}$ds less; glossy, white; whorls divided by a small separating line; apex obtuse; aperture suboval; pillar lip a little reflected, with a small tooth. Montagu refers to this species the *Turbo interstinctus* of Adams, Linn. Trans. iii. 66. t. xiii. f. 23, 24.

257. O. *insculpta.*—Whorls 6, rounded, and regularly striated spirally.

Turbo in. *Mont.* Test. Brit. Sup. 129.—Coast of Devon, rare.

Length $\frac{1}{8}$th of an inch, breadth $\frac{2}{3}$ds less; subpellucid, white; taper, apex obtusely pointed; aperture subovate; pillar-lip a little reflected, with a small cavity behind.

258. O. *Sandvicensis.*—"The three spired elegantly reticulated turbo, with a one-toothed oval aperture, from Sandwich, rare."—*Walk.* Test. Min. 15. t. ii. f. 55.

Gen. MONODONTA.—Pillar-lip notched or suddenly indented, so as to exhibit an imperfect canal.

1. M. *muricatus.*—Short, conical, whorls 5, with many equal muricated spiral ridges; lip plaited.—Turbo mur. *Sower.* Min. Conch. t. cclx. f. 4.—*Coral Rag.*

Gen. LII. SCALARIA.—Spire produced; transverse ridges on the body-whorl continuous with the pillar.

259. S. *Clathrus.*—Whorls 10, pointed, crossed by about ten regular continuous ribs; the intermediate spaces smooth.

Cochlea variegata, *List.* Conch. t. dlxxxviii. f. 51. *Bor.* Corn. 276. t. xxviii. f. 9.—Turbo clath. *Penn.* Brit. Zool. iv. 129. t. lxxxii. f. 3. *d.* t. 3. *a.*—T. clathratulus, *Don.* Brit. Sh. t. xxviii. upper figures.—Not common.

Length about an inch and a half, breadth at the base half an inch; colour usually white; volutions rounded; deeply divided by the separating line, across which the ribs are extended; pillar behind imperforated. The body-whorl is destitute of the keel-like spiral ridge which distinguishes the *S. lamellosa* of Lamarck, a species confounded with the preceding by Linnæus. Animal mottled black and white; discharges a purple dye; snout produced; tentacula slender, black; operculum coriaceous, black and spirally striated.

260. S. *clathratulus.*—Whorls 8, obtuse, crossed by upwards of 15 regular continuous ribs, the intermediate spaces smooth.

List. Conch. t. dlxxxviii. f. 51. lower figures.—Turbo clath. *Walk.* Test. Min. 12. t. ii. f. 45. *Maton* and *Racket*, Linn. Trans. viii. t. v. f. 1.—*Mont.* Test. Brit. 297.—Not common.

Length about half an inch, breadth about $\frac{2}{10}$ths; like the preceding, but more slender in its growth, the ribs more numerous and less elevated.

261. S. *Turtoni.*—Whorls about 12, pointed, crossed by about as many ribs, interrupted by a separating line; the intermediate spaces spirally striate.

Turba clathratus var. *Don.* Brit. Shells, t. xxviii, the lowest figure.—T. Turtoni, *Turton*, Conch. Dict. 208. f. 97.—On the Irish and English coasts.

Length two inches and a half, breadth three-quarters of an inch; pale brown, with two or three spiral dark bands. Shell strong; whorls rounded; the ribs are but little raised, rounded, bent at the line of separation; some are large, and longitudinally wrinkled; lips white, pillar-lip a little reflected.

In a paper by Mr Winch on the Geology of Lindisfarn, (Annals of Phil. xx. 434.) there is a notice of a recent species of this genus from the neighbouring sea, and which is there designated, "*Scalaria Trevelyana, Leach MS.*" I have not seen any specimens, or met with any description of this species.

EXTINCT SPECIES.

1. S. *similis.*—Whorls about 7, contiguous; spire with 5 or 6 rounded transverse elevations, close to each other, and somewhat decussated, the lowest

most prominent. Ribs distant, circular. Length an inch and a half, breadth about half an inch.—*Sower.* Min. Conch. t. xvi. two upper figures.—In *Crag*, from Bramerton.

2. S. *semicostata.*—Whorls about 7, contiguous; spire transversely striated, ribs numerous, but slightly raised, lower part of each volution smooth, naked.—*Sower.* Min. Conch. t. xvi. middle figure.—In *London Clay*, from Barton Cliff, and in *Crag* of Suffolk, (*Ib.* t. 390.)

3. S. *acuta.*—Whorls about 7, rather distant; spire with three slight transverse risings, and a fourth very prominent one, near the lower part of each turn. Ribbs recurved, expanded, and acutely angular at their upper ends; outer lip produced retrally.—*Sower.* Min. Conch. t. xvi. lowest figure.—In *London Clay*, Barton Cliff.

4. S. *subulata.*—Whorls contiguous; ribs 10 or 12, thick, reflected; the intervening spaces smooth.—*Sower.* Min. Conch. t. cccxc. f. 1.—*Crag*, Suffolk.

5. S. *foliacea.*—Whorls separate; ribs distant, slender, broad, leaf-like, reflected in the middle.—*Sower.* Min. Conch. t. cccxc. f. 2.—*Crag*, Suffolk.

6. S. *minuta.*—Whorls contiguous: ribs about 20, thin, obtuse, elevated.—*Sower.* Min. Conch. t. cccxc. f. 3, 4.—*Crag*, Suffolk.

GEN. LIII. CYCLOSTREMA. — Spire short; transverse ridges on the body-whorl disjoined from the pillar by a crenulated groove.

262. C. *Zetlandica.*—Shell conical; whorls 5, ribbed spirally and transversely, with angular tubercles at the points of decussation.

Mont. Linn. Trans. xi. 194. t. xiii. f. 3.—Zetland.

Length 2 lines; white; apex obtuse; whorls tumid; longitudinal ridges do not extend to the lower part of the body-whorl, where the spiral ridges are very prominent; aperture nearly orbicular, and marginated. A single example of this species occurred to me among shell-sand at Noss, Zetland. It was lent to my valued correspondent the late Mr Montagu, who omitted to return it, so that I can add nothing to the description which he has published.

GEN. LIV. DELPHINULA.—Spire depressed, produced, and tuberculated.

263. D. *calcar.*—Whorls 4, the upper ones depressed, forming a flat summit.

Mont. Test. Brit. Sup. 137, t. xxix. f. 3.—On the shore of Iona, Mr Laskey.

Breadth about a quarter of an inch; of a pale pink colour; round; on the body and part of the second whorls are large, smooth, lanceolate spines, radiating in straight lines from the shell, about 13 in number; base convex, with a central cavity; aperture orbicular.

◆

EXTINCT SPECIES.

1. D. *coronata.*—Discoid flat above, with broad flat pointed spines around its edge; concave beneath.—Euomphalus coronatus, *Sower.* Min. Conch. t. ccccl. f. 3.—*Lower Oolite*, Ancliff.

2. D. *nodosa.*—Upper side with a nearly central ridge; under side with a row of rather large nodular projections; aperture nearly round.—Euomphalus nodosus, *Sower.* Min. Conch. t. xlvi.—*Carboniferous Limestone*, Derbyshire.

3. D. *discors.*—Whorls three or four, above subimbricated, with four spiral projections; beneath concave, smooth.—Euomphalus dis. *Sower.* Min. Conch. t. lii. f. 1.—*Carboniferous Limestone*, Colebrook Dale.

4. D. *rugosa.*—Above imbricated, with four spiral projections; beneath plaited; margin rather acute.—*Park.* Or. Rem. iii. 77. t. vi. f. 7, 8.—Euomphalus rug. *Sower.* Min. Conch. t. lii. f. 2.—*Carboniferous Limestone*, Colebrook Dale.

5. D. *angulosa.*—Above subimbricated, with three spiral projections; beneath striated, with five obscurely plaited spiral projections; aperture obscurely octangular.—Euomphalus ang. *Sower.* Min. Conch. t. lii. f. 3.—*Carboniferous Limestone*, Benthall Edge.

6. D. *tuberculata.*—Discoid, whorls striated spirally and transversely, with a row of transverse tubercles on each side.—In *Carboniferous Limestone*, West Lothian.

Gen. CIRUS.—Spire produced.

1. *Leachii.*—Longitudinally striated; whorls many, with several rows of tubercles crossed by numerous small ridges; upper row of tubercles spiriform, compressed.—*Sower.* Min. Conch. t. ccxix. f. 3.—*Under Oolite*, Dundry.

2. *nodosus.*—Conical, acuminated, or discoid, with an acuminated spiral umbo; spire reversed; whorls many, with two rows of longitudinally extended tubercles, crossed by numerous small ridges.—*Sower.* Min. Conch. (cast) t. cxli. f. 2. and t. ccxix. f. 1, 2, 3.—*Under Oolite*, Dundry.

Gen. LV. SKENEA. — Spire depressed, and destitute of spinous processes.

264. S. *depressa.*—Whorls three or four, wrinkled across, with a deep groove for the separating line.

Serpula cornea, *Adams*, Linn. Trans. v. v. t. i. f. 33.—Helix depressa, *Mont.* Test. Brit. 439, t. xiii. f. 5.—At the roots of fuci, common.

Breadth one line; colour brown; whorls round; beneath, a large central cavity exposing the upper volutions; above, the whorls are nearly on a level, their central edge bending suddenly at the separating line, and forming a deep groove; the transverse lines of growth are irregular and rough; aperture circular, detached from the body-whorl, sometimes slightly reflected.

265. S. *serpuloides.* — Whorls three, white, smooth, and glossy.

Helix utrinque umbilicata apertura rotunda unici anfractus, *Walk.* Test. Min. 7. t. i. f. 26. (the fry).—Helix serp. *Mont.* Test. Brit. Sup. 147. t. xxi. f. 3.—Not uncommon from deep water.

Breadth about $\frac{1}{10}$th of an inch; subopake; whorls round, nearly on a level above, with a deep separating line; beneath, with a central cavity, round which there are traces, under a high magnifier, of diverging lines of growth; aperture circular, with the margin a little reflected.

266. S. *divisa.*—Whorls three or four; the upper half of each smooth, the under half spirally striated.

Turbo divisus, *Adams*, Linn. Trans. iii. 254.—Common from deep water.

Breadth scarcely a line; white, glossy, subpellucid; whorls round, nearly on a level above, with a deep separating line; beneath, the central cavity is large, and exposes the superior volutions; aperture circular, and usually detached from the body-whorl.

◆

The following Extinct Species appear to belong to this genus.

1. S. *æqualis.*—Equilaterally concave, with one obscure keel on the right side, and two on the left; smooth; whorls exposed; aperture orbicular.—*Sower.* Min. Conch. t. cxl. f. 1.—In *Carboniferous Limestone.*

2. S. *concava.*—Discoid, involute, flat on one side, concave on the other; whorls four, the last but slightly attached.—Vermicularia con. *Sower.* Min. Conch. t. lvii. f. 1–5. —In *Green Sand.*

3. S. *umbonata.*—Discoid, involute; umbonated above, concave beneath; whorls three, the smallest concealed in the umbo.—Vermicularia umb. *Sower.* Min. Conch. t. lvii. f. 6, 7.—Mr Mantell adds, that the outer volution is produced, and marked with distant annular ridges.—Geol. Suss. iii. t. xviii. f. 24.—*Grey Chalk Marl.*

4. S. *ovata.*—Discoid, involute, rudely ovate, a little concave beneath; whorls three.—Vermicularia ovata, *Sower.* Min. Conch. t. lvii. f. 8.—*Upper Oolite.*

5. S. *catillus.*—Depressed; beneath nearly flat, above concave, somewhat contracted, crossed with oblique striæ; whorls three, externally broad, convex, oblique, transversely striated, and bordered on each side by a sharp edge. —Helix catillus, *Mart.* Derb. t. vii. f. 1, 2.—Euomphalus cat. *Sower.* Min. Conch. t. xlv. f. 3, 4.—In *Carboniferous Limestone.*

6. S. *perangulatus.*—A prominent central ridge or rising angle on the upper side, within which is a flat obliquely depressed space to the separating line; the other side obtusely angulated; striæ of hair-like growth; whorls almost wholly exposed; aperture obscurely pentangular, rounded on the outer side.—*Park.* Org. Rem. iii. 77. t. vi. f. 7, 8.—Euomphalus pent. *Sower.* Min. Conch. t. xlv. f. 1, 2.—*Carboniferous Limestone*, Ireland.

7. S. *funata.*—Conical, very short; with many spiral threads, united by more numerous transverse lines; central cavity rather small.—Euomphalus fun. *Sower.* Min. Conch. t. ccccl. f. 1, 2.—*Carboniferous Limestone*, Dudley.

8. S. *carinata.*—Discoid, smooth, whorls five ventricose, obtusely carinated; convex below, central cavity large; aperture transverse, obovate.—Cirus car. *Sower.* Min. Conch. t. ccccxxix. f. 3, 4.—*Lias*, Cheltenham.

GEN. EUOMPHALUS.—Spire produced.

1. E. *acutus.*—Whorls eight, conical, sharp, with an obtuse ridge near the upper part of each, within which there is a flat space; aperture round.—*Sower* Min. Conch. t. cxli.—In *Carboniferous Limestone*, Ireland.—It is nearly related to *Skenea pentangularis*, from which it differs in the produced spire, and in the flat space on the top of each whorl not reaching to the centre.

2. E. *rotundatus.*—Conical, nearly smooth, whorls convex; central cavity large; aperture round.—Cirus rotundatus, *Sower.* Min. Conch. t. ccccxxix. f. 1, 2.—*Carboniferous Limestone*, Yorkshire.

3. E. *plicatus*.—Conical, transversely striated, base angular, sides flattened, central cavity plaited or deeply striated; aperture oblong.—Cirus plicatus, *Sower.* Min. Conch. t. cxli. f. 3.—*Chalk Marl*, Folkstone.

4. E. *perspectivus*.—Obtusely conical; spirally striated, central cavity deep, exposing one-third of each whorl; aperture transversely oblong.—Cirus per. *Mant.* Geol. 194. t. xviii. f. 12, 21. *Sower.* Min. Conch. t. ccccxxviii. f. 1, 2. —In *Chalk.*

5. E. *depressus*.—Subdiscoid, concentrically striated; central cavity wide, exposing a small portion of each whorl; an angular canal runs round the spire; aperture obtusely angular.—Cirus depressus, *Mant.* Geol. 195. t. xviii. f. 18, 22. *Sower.* Min. Conch. t. ccccxxviii. f. 3.—In *Chalk.*

6. C. *granulatus*.—Conical; whorls five or six, obscurely quadrangular, ornamented with regular transverse granulated striæ.—*Mant.* Geol. 195.—*Upper Chalk.*

7. C. *Sowerbii*.—Conical, spiral, smooth, umbilicate; inner wreaths anchylosed slightly inserted; aperture indented by the preceding volution.—Vermicularia Sower. *Mant.* Geol. iii. t. xviii. f. 14. 15.—*Grey Chalk Marl.*

8. C. *Bognorensis*.—Spiral, last volution much produced, inferior side deeply umbilicate.—Verm. Bog *Mant.* Geol. 272.

GEN. LVI. PALUDINA.—Shell conical, mouth a little longer than broad; pillar-lip simple.

267. P. *vivipara*.—Whorls five or six, rounded; separating line deep; apex like a minute tubercle.

Cochlea maxima, *List.* An. Ang. 133. t. ii. f. 18. Conch. t. cxxvi. f. 26. —Helix vivipara, *Linn.* Syst. i. 1247.—Nerita viv. *Mull.* Verm. ii. 182,—Hel. viv. *Mont.* Test. Brit. 386.—Cyclostoma viviparum and achatinum, *Drap.* Moll. 34, 36.—In the slow running rivers of England.

Length sometimes an inch and a half, the breadth one inch; olive-green, with three brown spiral bands; whorls with an abruptly fine apex, irregularly wrinkled by layers of growth; the body-whorl occupying about two-thirds of the length of the shell; aperture nearly semicircular; pillar-lip a little reflected, behind which is a small cavity; operculum corneous; concentrically striated. Young about ten in number.—This varies a little in the shape of its aperture, and in the relative size and distance of the coloured bands.

268. P. *tentaculata*.—Whorls five or six, a little rounded; apex entire.

Cochlea parva, *List.* An. Ang. 135. t. ii. f. 19. Conch. t. cxxxii. 32.—Helix tentaculata, *Linn.* Syst. i. 1249.—Nerita jaculator, *Mull.* Verm. ii. 185.—Hel. tent. *Mont.* Test. Brit. 389.—In stagnant waters, England and Ireland.

Length half an inch, breadth one quarter, smooth, glossy, horn-coloured, with fine lines of growth; whorls increasing less rapidly than in the preceding species, the body whorl occupying about the half of the length of the shell; aperture ovate, slightly contracted retrally; pillar-lip a little reflected; tentacula setaceous, and continually in motion. The young of this species constitute the *Nerita sphærica* of Muller, and the *Cyclostoma simile* of Draparnaud.

269. P. *acuta*.—Whorls five or six, a little rounded, tapering; apex entire.

Cyclostoma acutum, *Drap.* Moll. 40. t. i. f. 23.—Turbo Leachii, *Sheppard*, Linn. Trans. xiv. 152.—Cyc. acutum, *Turton*, Zool. Journ. ii. 565.—In stagnant ditches, England.

Length from 2 to 3 lines, breadth nearly ⅔ds less; diaphanous, of a horn colour; the body-whorl occupies about one-half of the shell; aperture approaching to semicircular; pillar-lip a little reflected, with a slight cavity behind. This shell is subject to some variety in its growth. The specimens in my possession from Bristol, were communicated by Mr Thomas Drummond.

EXTINCT SPECIES.

1. P. *fluviorum.*—Whorls four to six, convex; shell about twice the length of the aperture; lines of growth rather sharply conspicuous, giving the shell a finely striated appearance.—Vivipara fluv. *Sower.* Min. Conch. t. xxxi. f. 1. —*Mantell*, Geol. Suss. 45. t. xvii. f. 56.—In Limestone above and below the *Iron sand.*

2. P. *extensa.*—Whorls four or five, subconvex, lower part rather angular; inner lip swelling a little at the umbilical side, outer lip extended outwards; shell about twice the length of the aperture.—Viv. est, *Sower.* Min. Conch. t. xxxi. f. 2.—With the preceding.

3. P. *lenta.*—Smooth; whorls five or six, scarcely angular; lines of growth occasionally conspicuous; aperture nearly round, entire.—*Sower.* Min. Conch. t. xxxi. f. 3.—*London Clay*, at Hordwell and Barton.

4. P. *concinna.*—Shell rather conical; whorls four or five; slightly convex; lower part rather angular.—*Sower.* Min. Conch. t. xxxi. f. 4, 5.—Barton Cliff.

5. P. *suboperta.*—Whorls five, convex, with a depressed line along the upper part; a little wrinkled; outer lip folding partly over the upper part of the aperture; shell about twice the length of the aperture.—*Sower.* Min. Conch. t. xxxi. f. 6.—*Crag*, Holywells.

The three preceding species probably belong to the marine genus *Cingula*, nor is it certain that the two following are true *Paludinæ.*

6. P. *elongata.*—Ovato lanceolate, smooth; whorls five, convex; aperture elongated. *Sower.* Min. Conch. t. DIX. f. 1, 2.—*Weald Clay.*

7. P. *carinifera.*—Ovato-conical, smooth; whorls four, convex, the upper two bounded by a linear keel at the lower edge.—*Sower.* Min. Conch. t. DIX. f. 3.—*Purbeck Limestone.*

GEN. AMPULLARIA.—Shell globose, pillar-lip prominent and reflected.

1. A. *acuta.*—Ventricose, smooth, with a small acute spire; pillar-cavity small, half closed; aperture ovate, elongated.—(Helix mutabilis, *Brander*, f. 58, 59.) *Sower.* Min. Conch. t. cclxxxiv. three upper figures.—*London Clay.*

2. A. *patula.*—Ventricose, smooth, with a short spire; pillar-cavity large, open, lined with a spiral adpressed plate; aperture obovate,—(Helix mutabilis, *Brander*, f. 57.) *Sower.* Min. Conch. t. cclxxxiv. two middle figures.—*London Clay*, Barton.—This species seems nearly related to *Turbo quadrifasciatus.*

3. A. *segaretina.*—Ventricose, short, spire small, acute, with sharp transverse striæ; pillar-cavity covered, small, half filled by a spiral plate; aper-

ture suborbicular; right lip enlarged.—*Sower.* Min. Conch. t. cclxxxiv. two lower figures.—*London Clay.*

4. A. *ambulacrum.*—Globose, with a canal round an acute spire; pillar-cavity plain within.—*Sower.* Min. Conch. t. ccclxxii.—*London Clay.*

5. A. *nobilis.*—Subglobose, smooth; spire conical, composed of a few convex whorls; base very convex; no pillar cavity; aperture elliptical, sublunate, pointed above.—*Sower.* Min. Conch. t. DXXII. f. 1.—*Carboniferous Limestone.*

6. A. *helicoidis.*—Almost discoid, smooth; spire very short, blunt; whorls nearly blended, round; base with a pillar cavity; aperture oblong.—*Sower.* Min. Conch. t. DXXII. f. 2.—*Carboniferous Limestone,* Ireland.

7. A. *canaliculata.*—" Ventricose, whorls three or four; transversely and obliquely striated; the striæ decussating each other; spire short; turns of the spire separated by a deep channel."—*Mant.* Geol. Suss. 87. t. xix. f. 13. *Blue Chalk Marl.*—Mr Mantell likewise refers another shell to this genus, but with doubt, " a subglobose, ventricose, univalve," p. 111. t. xviii. f. 11.

GEN. MELANIA.—Shell turrited; aperture oblong; pillar-lip smooth, and bent in the middle.

1. M. *sulcata.*—Spire more than five times the length of its diameter, with spiral striæ; a concave furrow between each whorl; whorls fourteen.—*Sower.* Min. Conch. t. xxxix. middle figure.—*London Clay,* Stubbington Cliffs.

2. M. *Heddingtonensis.*—A shell about three times as long as the diameter; whorls eight or more, the surface of each concave near the middle, with an obtuse angled rising near the upper part.—*Sower.* Min. Conch. t. xxxix. right and left hand figures.—*Upper* and *Middle Oolite.*

3. M. *striata.*—Length two and a half times as long as the diameter; whorls six or more, with about sixteen rounded spiral ribs, nearly equal on the outer part of the whorls, but widened on the concealed parts.—*Sower.* Min. Conch. t. xlvii.—*Lias.*

4. M. *lineata.*—Acuminated; whorls nine, finely striated across; aperture angular above.—*Sower.* Min. Conch. t. ccxviii. f. 1.—*Inferior Oolite,* at Dundry.

5. M. *fasciata.*—Turrited, short; whorls six, spirally striated, marked with three coloured bands, coronated; aperture ovate.—*Sower.* Min. Conch. t. ccxli. f. 1.—*Fresh-water Formation,* Isle of Wight.

6. M. *costata.*—Turrited, spirally striated, transversely ribbed; mouth obovate.—*Sower.* Min. Conch. t. ccxli. f. 2.—*London Clay,* Hordwell.

7. M. *minima.*—Turrited, smooth; sides straight; mouth ovate, pointed above; base slightly produced.—*Sower.* Min. Conch. t. ccxli. f. 3.—*London Clay,* Brakenhurst, Hants.

8. M. *truncata.*—Conical, elongated, smooth; whorls angular below; mouth ovate, acute above, truncated below.—*Sower.* Min. Conch. t. ccxli. f. 4.—*London Clay,* Brakenhurst.

With the exception of M. *fasciata,* it is doubtful if any of the preceding species belong to the genus *Melania.* It is more probable that they are related to the marine *Turbonidæ.*

9. M. *costellata.*—Turrito-subulated spirally, with numerous longitudinal ribs; anteal lip with a canal in the inside.—*Lam.* Hist. Vert. vii. 543. (*Brander,* Foss. Hant. f. 27.)—*Mant.* Geol. 269.

NERITADÆ.

* *Marine.*
Nerita.
Natica.

** *Fluviatile.*
Neritina.

GEN. LVII. NERITA.—Pillar-lip flat, entering the cavity, entire behind.

270. N. *littoralis.*—Whorls five, nearly smooth, the outer lip thin on the edge, thickened within.

Nerita ex fusco-viridescens, *List.* An. Ang. 164, t. iii. f. 11, 12, 13. Conch. t. DCVII. f. 39–44.—N. litt. *Linn.* Syst. 1253. *Mont.* Test. Brit. 467. —Common on sea rocks, covered with the tide.

Length and breadth about three-quarters of an inch. Shell thick and strong, variously coloured; whorls increase rapidly, spire short, depressed, the separating line small; aperture semicircular, but the pillar is more rounded anteally, where it joins the outer lip, than is usual in the genus; hence Lamarck has placed the shell in the genus *Turbo* (*T. retusus*, Hist. Vert. vii. 48.); a subperforation appears on the pillar. This shell is subject to considerable variation in the shape, arising from the spire being more or less produced; the body-whorl round or compressed, and the outer lip retrally joining the upper or middle part of the whorl.

271. N. *Virginea.*—Smooth, polished; pillar-lip toothed.

Nerita, *List.* Conch. t. DCVI. f. 35. *Turton's* Conch. Dict. 127.—West coast of Ireland.

Breadth of those found by Dr Turton hardly the eighth of an inch, pale, ferruginous, with black zigzag lines running in various directions; whorls little raised, a black line round the junctions.

* * *

EXTINCT SPECIES.

1. N. *lævigata.*—Pointed, smooth; spire conical, with straight sides; base convex.—*Sower.* Min. Conch. t. ccxvii. f. i.—*Inferior Oolite.*

2. N. *sinuosa.*—Obtuse, uneven; spire short, with convex whorls; aperture with a rounded sinus near the base, and an angular sinus near the middle.—*Sower.* Min. Conch. ccxvii. f. 2.—Portland *Oolite* at Chilmarsh.

3. N. *globosa.*—Subglobose, transversely sulcated; spire apparent; one tooth upon the inner lip; outer lip plain within.—*Sower.* Min. Conch. t. ccccxxiv. f. 1.—*London Clay.*

4. N. *aperta.*—Subhemispherical, smooth; spire visible, depressed; aperture orbicular, expanded; inner lip obscurely crenated, bearing one large tooth.—*Sower.* Min. Conch. t. ccccxxiv. f. 2, 3, 4.—*London Clay.*

5. N. *minuta.*—Hemispherical, smooth; spire indistinct, aperture oval; pillar-lip not toothed.—*Sower.* Min. Conch. t. cccclxiii. f. 3, 4. *Oolite* at Ancliff.

6. N. *costata.* Hemispherical; spire conspicuous, impressed; whorls transversely costated; costæ thin, sharp, numerous; aperture expanded, orbicular; columellar lip prominent, obtuse. *Sower.* Min. Conch. t. cccclxiii. f. 5, 6. *Oolite*, Ancliff.

7. N. *spirata.* Semiglobose, smooth; spire small, partly immersed; upper parts of the whorls flat, when old, concave; aperture transversely oval.—*Sower.* Min. Conch. t. cccclxiii. f. 1, 2. *Mountain Limestone.*

8. N. ———I possess some imperfect specimens of a species differing from the preceding in size, and in the spire being larger. From the *Transition Limestone* of Cork.

9. N. *striata.* Spire slightly produced; whorls flat, crossed by numerous narrow rounded ribs. I found an imperfect specimen of this shell in *Carboniferous Limestone* at Corry, Arran 5th June 1807. It bears a close resemblance to the recent *Nerita polita.*

GEN. LVIII. NATICA.—Pillar-lip entire, not entering the aperture, with a cavity or callus behind.

272. N. *glaucina.*—Whorls six, smooth, pillar-lip thick and reflected, forming a large and deep cavity.

Cochlea rufescens, *List.* An. Ang. 163. t. iii. f. 10. Conch. 568. f. 19.—Nerita glaucina, *Linn.* Syst. i. 1251. *Mont.* Test. Brit. 469. Inhabits deep sandy bays, common.

Length about an inch and a half, breadth rather less; whorls little elevated; apex pointed; colour brownish white, with interrupted bands of brown on the upper volutions; outer lip considerably advanced at its junction with the body; operculum divergingly striated. Mr Hog has demonstrated, that the substance known under the name of *Flustra arenosa*, is the nidus of this species, in the cells of which the eggs are deposited. Linn. Trans. xiv. 318. The *Nerita pellucida* and *alba* of Adams, ib. iii. 67. are probably the fry of this species.

273. N. *nitida.*—Whorls five; pillar cavity half closed.

Nerita nit. *Don.* Brit. Shells, 144. *Mont.* Test. Brit. Sup. 149. On different parts of the coast, not common.

Diameter scarcely half an inch; glossy, white; spire short; whorls nearly flat, with the separating line nearly obliterated.

274. N. *rufa.*—Smooth, purplish, with a white band round the top of the volutions, and two others on the body-whorl.

Nerita rufa, *Mont.* Test. Brit. Sup. 150. t. xxx. f. 3. English and Scottish coast, rare.

Breadth about half an inch; pillar-lip forms a large projection over the cavity behind, producing an indenture on each side of it. The second whorl in this is larger in proportion than in *N. glaucina.*

275. N. *intricata.*—Pillar-cavity furnished with two spiral ridges and two grooves.

Nerita in. *Don.* Brit. Shells, t. clxvii. N. canrena, *Mont.* Test. Brit. Sup. 148. Weymouth, rare.

Length about half an inch; smooth, livid, with bands of sagittate ferruginous lines; pillar-cavity very large. This species has occurred only to Mr Donovan.

276. N. *tuberosissima*.—Whorls four, marked with four spiral broken tubercular ridges.

Nerita tub. *Mont.* Test. Brit. Sup. 150. t. xxix. f. 5.—At Dunbar, Mr Laskey.

Breadth about ⅛th of an inch; pellucid, white; upper volutions small; pillar-cavity large.

277. N. *sulcata*.—Whorls four, with remote oblique transverse striæ.

Nerita sul. *Turton.* Conch. Dict. 124. fig. 56, 57.—N. glabrissimus, *Brown*, Wern. Mem. ii. 532. t. xxiv. f. 12.—Two specimens found in Dublin Bay by Dr Turton.

Breadth ⅛th of an inch; globular, semitransparent, bluish-white; whorls swollen, well defined; pillar-lip flat, projecting a little in the middle over the cavity behind, which is long and deep.

278. N. *pallidula*.—Whorls three, pillar-lip with a wide groove leading to the cavity.

Ner. pall. *Don.* Brit. Sh. t. xvi. f. i. *Mont.* Test. Brit. 468.—Turbo pallidus and puteolus, *Turt.* Conch. 192.—Among sea weeds, about low water-mark, common.

Length ½ an inch, breadth ⅜ths; yellowish-brown; whorls rounded, with a grooved separating line, the upper ones small, lateral, and little produced, slightly wrinkled by the layers of growth; pillar-cavity deep, the retral extremity of the lip partly folded over it; operculum with diverging wrinkles.

279. N. *lacuna*. — Whorls four; pillar-lip with a narrow groove leading to the cavity.

Ner. lac. *Mont.* Test. Brit. 428. t. xiii. f. 6.—Turbo lacuna, *Turt.* Conch. Dict. 193. t. xxv. f. 87, 89.—On the English shores, rare.

This shell bears a very close resemblance to the preceding. Judging from an authentic example which I received from Mr Montagu, it chiefly differs in the less enlargement of the body-whorl towards the aperture, the second whorl being better defined, the pillar-groove narrower, and the anteal curvature of the lip more restricted: there are likewise some faint traces of spiral striæ.

EXTINCT SPECIES.

1. N. *glaucinoides*.—Nearly globose spire, rather elongated; pillar-cavity simple, partly covered; upper part of each whorl slightly depressed.—*Sower.* Min. Conch. t. v. three upper figures, and t. cccclxxix. f. 4.—*London Clay* and *Suffolk Crag.*

2. N. *similis*.—Shell rather rhomboidal; spire short; pillar cavity divided by a spiral projection; aperture slightly angular above.—*Sower.* Min. Conch. t. v. two middle figures.—*London Clay.*

3. N. *depressa*.—Nearly globose, subumbilicated; upper part, and the side of each whorl, flattened, so as to appear nearly square; columella depressed beneath; aperture angular at the upper part.—*Sower.* Min. Conch. t. v. lower figures.—*Crag-marl.*

4. N. *patula.*—Hemispherical, smooth, spire small, depressed; pillar cavity open, containing a spiral ridge.—*Sower.* Min. Conch. t. ccclxxiii. three lower figures.—*Suffolk Crag.*

5. N. *striata.*—Subhemispheroidal, smooth; spire small, depressed; pillar cavity open; base concentrically striated.—*Sower.* Min. Conch. t. ccclxxiii. two upper figures.—*London Clay.*

6. N. *cirriformis.*—Globose; whorls slightly compressed laterally; spire conspicuous; pillar cavity large, deep, open; pillar lip thick, with a sinus in the middle; aperture small, oblong.—*Sower.* Min. Conch. t. cccclxxix. f. 1. —*Suffolk Crag.*

7. N. *hemiclausa.*—Subglobose; spire small, conical, pointed; cavity half closed by the upper part of the pillar lip; aperture oval.—*Sower.* Min. Conch. t. cccclxxix. f. 2.—*Crag.*

8. N. *sigaratina.*—Much depressed; pillar cavity large, filled with a lenticular callus.—*Sower.* Min. Conch. t. cccclxxix. f. 3.—*London Clay.*

GEN. LIX. NERETINA.—Pillar lip broad, flat, entire; outer lip patulous.

280. N. *fluviatilis.*—Transversely oval, outer lip thin.

Nerita fluviatilis, *List.* An. Ang. 136. t. ii. f. 20. Conch. t. 607. f. 43.—*Linn.* Syst. 1253. *Mont.* Test. Brit. 470.—On stones in slow running rivers in England and Ireland.

Length $\frac{3}{8}$ths of an inch, breadth $\frac{2}{8}$ths; variously streaked or spotted with purple white and brown; the whorls rounded, the upper ones small; slightly striated across by the lines of growth; pillar lip white; lid yellow, with a lateral tooth behind, imbedded in the foot.

EXTINCT SPECIES.

1. N. *concava.*—Obovate, with a prominent obtuse spire; upper part of each whorl concave; aperture semicircular; lip entire.—*Sower.* Min. Conch. t. ccclxxxv. f. 1–8.—In various strata from the *London Clay* to the *Crag.*

2. N. *uniplicata.*—Subglobose, with a concealed spire, and one plait upon the rather convex pillar lip.—*Sower.* Min. Conch. t. ccclxxxv. f. 9. 10.—*London Clay.*

TROCHUSIDÆ.

GEN. LX. TROCHUS.—Base flat or concave; aperture transversely depressed.

* *Pillar perforated.*

281. T. *Magus.*—Spire subdepressed; whorls six, flattened above towards the deep separating line; the last whorls tuberculated.

T. planior, *List.* Conch. t. 641. 31.—T. Magus, *Linn.* Syst. i. 1228. *Mont.* Test. Brit. 283.—In deep water, not common.

Breadth about an inch, height one-fourth less; variously marked with red, blue, and white; base slightly convex; whorls spirally striated; the upper part of the two last waved or tuberculated, and a raised rib round the base of each; pillar cavity wide, with an open spiral groove.—Specimens of a shell exactly corresponding with *Turbo carneus* of Mr Lowe (Zool. Journ. vol. ii. p. 107. t. v. f. 12. and which Mr Gray has identified with the *Margarita striata* of Leach (Ross's Voyage of Discov. App.), Zool. Journ. vol. ii. 567.), which I found plentifully in Zetland, were sent to Mr Montagu in 1809, who pronounced them the fry of a Trochus. There can be little doubt of their relation to the present species.

282. T. *umbilicatus.*—Spire bluntly conical; whorls nearly even, obsoletely striated at the base.

> T. crebris striis fuscus, *List.* An. Aug. 1669. t. iii. f. 15. Conch. dcxli. f. 31.—T. umbilicaris, *Penn.* Brit. Zool. iv. 126.—T. cinerarius, *Don.* Brit. Shells, t. lxxiv. three middle figures.—T. umbilicatus, *Mont.* Test. Brit. 286.—On Fuci near low water-mark.

Breadth $\frac{6}{8}$ths, height $\frac{5}{8}$ths of an inch; whitish, with waved purple stripes. Whorls five, imperfectly marked by the separating line; striated, smooth; pillar cavity with sloping wrinkled sides; the margin of the cavity and of the body whorl rounded.

283. T. *cinerarius.*—Spire subdepressed, with a minute apex; whorls with a well defined separating line; strongly striated at the base.

> *Penn.* Brit. Zool. iv. 127. *Don.* Brit. Shells, t. lxxiv. two upper and two lower figures. *Mont.* Test. Brit. 284.—Near low water-mark.

Height and breadth about $\frac{3}{8}$ths of an inch; grey, with numerous lines of purple; whorls five; strongly striated, the striæ interrupted by the lines of growth, giving the surface a rough feel; pillar cavity large: the tentacula and lateral filaments not so dark nor so strongly marked with annular rings as the preceding.—I am not satisfied with the claims of this species as distinct from the preceding. They are probably only varieties constituting the *Trochus cinerarius* of Linnæus.

284. T. *tumidus.*—Whorls subquadrangular, with numerous spiral striæ slightly decussated by the lines of growth.

> *Mont.* Test. Brit. 280. t. x. f. 4. 4.—In deep water.

Length about $\frac{4}{10}$ths, and breadth about $\frac{3}{10}$ths of an inch; dusky white with spotted transverse lines of purplish-brown; whorls five, flat at top, nearly even on the sides, or rather slightly concave, with the lower edge subcarinated; base a little rounded, the lines of growth diverging from the pillar cavity, which is variable in size.—The *Trochus umbilicatus* of Walker (Test. Min. tab. ii. f. 58.) is considered as referable to this species.

The *Trochus cinereus* of Da Costa (Brit. Conch. 42. t. iii. f. 9, 10.), *List.* Conch. t. dcxxxiii. f. 21.; *Don.* Brit. Shells, t. clv, f. 2, has not occurred to any other collector of British shells. He states it as common on many parts of the coast. The species, however, to which he refers, is of foreign growth, and readily distinguished by its concave base, wide pillar cavity, and jagged pillar lip.

** *Pillar closed.*

285. T. *crassus.*—Whorls five, rounded, wrinkled; the pillar lip with a blunt tooth.

T. lineatus (Da Costa, Brit. Conch. 100. t. vi. f. 7.), *Don.* Brit. Shells, t. 71.—T. crassus, *Mont.* Test. Brit. 281.—English coast, on rocks about mid tide.

Length and breadth about an inch; purplish-brown, with numerous white zigzag lines; shell strong, whorls coarse and wrinkled by the lines of growth; base convex; aperture rounded; pillar lip concave in the middle, in front of which is the tooth. According to Montagu there is a sort of plume behind the left eye, composed of simple contiguous fibres.

286. T. *papillosus.*—Whorls eight, flat, with numerous spiral tuberculated ridges and striæ.

(*Da Costa*, Brit. Conch. p. 38. No. 20. t. iii. f. 3.) *Don.* Brit. Shells, t. cxxvii.—T. tenuis, *Mont.* Test. Brit. 275. t. x. f. 3.—South coasts of England and Ireland.

Length 1¼th inch, breadth rather less; pale reddish-brown, with red spots; whorls scarcely distinguished by the separating line; the tubercles on the ridges are transverse, smooth, the intervening striæ are slightly decussated by the lines of growth; base with numerous, spiral grooves, finely striated across by the lines of growth; aperture slightly angular; pillar-lip concave.

287. T. *ziziphinus.*—Whorls eight, flat, separated by a smooth circular ridge, obsoletely striated spirally.

T. albidus, *List.* An. Ang. 166. t. iii. f. 14. Conch. t. DCXVI. f. 1.—T. ziz. *Linn.* Syst. 1231. *Mont.* Test. Brit. 274.—Not uncommon, near low water mark.

Length and breadth about an inch; livid, the separating ridge with darker and lighter coloured spaces; spire conical, pointed; base smooth, spirally striated with diverging curved lines of growth; aperture quadrangular; the pillar-lip slightly concave, with an obsolete tooth at the anteal extremity.—A white variety of this shell was sent me several years ago by Dr Leach, with the name *T. Lyonsii*, from Tenby.

288. T. *exasperatus.*—Whorls seven, flat, separated by a tuberculated circular ridge.

T. pyramidalis parvus, *List.* Conch. t. DCXVI. f. 2.—T. exasp. *Penn.* Brit. Zool. iv. 126.—T. conulus, *Don.* Brit. Shells, t. viii. f. 2.—T. exiguus, *Mont.* Test. Brit. 277.—Southern coasts, rare.

Length ⅜ths of an inch, breadth ⅜ths; crimson-red, with white spots; whorls with four smaller slightly tuberculated spiral ridges, the intervening spaces pitted; base with nearly smooth spiral striæ, slightly convex where the body-whorl enters the aperture.

289. T. *striatus.*—Whorls seven, flat, with an indistinct separating ridge, smooth on its upper surface.

Linn. Syst. i. 1230. *Pult.* Dorset, p. 44. *Mont.* Test. Brit. 278.—T. conicus, *Don.* Brit. Shells, t. clv. f. 1.—T. erythroleucos, *Turt.* Conch. Dict. 191.—On the southern coasts.

Length ⅜ths of an inch, breadth ⅜ths; grey, with transverse waved black lines; spiral striæ, on the base and surface of the whorls, numerous, crossed by sharp oblique lines of growth, which extend across the outer edge of the separating ridge; base flat, the body-whorl, where entering the aperture, slightly concave; aperture angulated.

EXTINCT SPECIES.

1. T. *agglutinans.*—Depressed, conical, smooth; base expanded, with a broad waved margin; whorls externally deformed; pillar-cavity plicate; aperture oblong.—(T. umbilicaris, *Brander*, Foss. Hant. f. 4–5.)—*Sower.* Min. Conch. t. xcviii.—Smaller figure.—*London Clay.*

2. T. *Benettiæ.*—Depressed, conical; upper surface obliquely wrinkled; base expanded, with a broad waved margin; whorls externally irregular; pillar-cavity plicate, partly covered; aperture narrow.—*Sower.* Min. Conch. t. xcviii.—Larger figure.—*London Clay.*

3. T. *anglicus.*—Conical, base rather convex; volutions squarish, with tubercles upon their angles, transversely carino-striate, and a rounding elevation in their centres; lines of growth decussating the three central striæ; pillar imperforate.—*List.* Conch. t. MDCCCXXXVI. f. 16. *Sower.* Min. Conch. t. cxlii.—*Lias.*

4. T. *lævigatus.*—Conical, nearly smooth; sides straight; base convex, with an obtuse margin; aperture rhomboidal, with rounded angles; no pillar cavity.—*Sower.* Min. Conch. t. clxxxi. f. 1.—*Crag.*

5. T. *similes.*—Conical, sides straight, ornamented with many transverse ridges, two or three of which upon each whorl are granulated; base flattish, concentrically striated; aperture quadrangular; pillar direct.—*Sower.* Min. Conch. t. clxxxi. f. 2.—*Crag.*

6. T. *angulatus.*—Conical, sides of the whorls concave; base flattish; margin carinated; aperture acutely rhomboidal; no pillar cavity.—*Sower.* Min. Conch. t. clxxxi. f. 3.—*Inferior Oolite.*

7. T. *duplicatus.*—Conical, sides of the whorls concave; a double deeply crenulated carina round the base; pillar cavity open, with a tubercular margin; aperture quadrangular.—*Sower.* Min. Conch. t. clxxxi. f. 5.—*Under Oolite.*

8. T. *dimidiatus.*—Conical, base convex, with a carinated margin; upper part of the whorl concave, with an entire carina in the middle; aperture pentangular; pillar direct and solid.—*Sower.* Min. Conch. t. clxxxi. f. 4.—*Under Oolite.*

9. T. *punctatus.*—Conical, with straight sides, transversely striated; upper striæ upon each whorl crossed by oblique undulations; lower ones minutely granulated; a narrow band between the two sets.—*Sower.* Min. Conch. t. cxciii. f. 1.—*Inferior Oolite.*

10. T. *elongatus.*—Conical, elongated, transversely striated; striæ near the apex granulated; each whorl slightly undulated near the upper edge, with an obscure band before the middle; the inferior margin prominent.—*Sower.* Min. Conch. t. cxciii. f. 234.—*Inferior Oolite.*

11. T. *abbreviatus.*—Conical shortened, transversely striated; striæ obscurely decussated by oblique lines of growth; inferior margin of each whorl very prominent, obtuse, with an obscure band above it.—*Sower.* Min. Conch. t. cxciii. f. 5.—*Inferior Oolite.*

12. T. *fasciatus.*—Conical, umbilicate, decussate striated; whorls slightly convex, with a band around their middle; base flattish; aperture quadrangular.—*Sower.* Min. Conch. t. ccxx. f. 1.—*Inferior Oolite.*

13. T. *arenosus.*—Conical, very short, granulated, whorls rather convex above, with a band along the middle; base convex, in part nearly smooth.—*Sower.* Min. Conch. t. ccxx. f. 2.—*Inferior Oolite.*

14. T. *prominens.*—Conical, short, whorls convex, finely striated, with a

sulcus around the middle ; base flattish.—*Sower.* Min. Conch. t. ccxx. f. 3.—*Inferior Oolite.*

15. T. *pallium.*—Conical, depressed, with concentric furrows, and diverging striæ ; whorls above depressed, with many tubercular undulations ; in the middle flattened, with a longitudinal band ; base convex, umbilicated ; margin largely crenulated.—*Sower.* Min. Conch. t. ccxxi. f. 1.—*Inferior Oolite.*

16. T. *tiara.*—Depressed, conical, with diverging striæ ; volutions obscurely bicarinated, deeply undulated above, concentrically striated beneath ; base convex, with a large pillar-cavity.—*Sower.* Min. Conch. t. ccxxi. f. 2.—*Green Sand.*

17. T. *Sedgwicki.*—Conical, smooth ; base carinated ; whorls concave above, convex below ; margin and base striated.—*Sower.* Min. Conch. t. cclxxii. f. 1. —*Suffolk Crag.*

18. T. *imbricatus.*—Pyramidal, with several transverse threads upon each whorl, crossed by fine longitudinal striæ ; whorls angular, imbricating, flat above, very convex beneath ; pillar-cavity closed.—*Sower.* Min. Conch. t. cclxxii. f. 3, 4.—*In Lias Clay.*

19. T. *reticulatus.*—Conical, transversely reticulato-striated ; whorls bicarinated ; base convex.—*Sower.* Min. Conch. t. cclxxii. f. 2.—*Upper Oolite.*

20. T. *Gibsii.*—Conical, short, umbilicated ; sides straight ; edge obtusely carinated ; base convex, reticulato-striated ; in the centre of the upper part of the whorls, is an elevated band, crossed by curved striæ ; aperture rhomboidal.—*Sower.* Min. Conch. t. cclxxviii. f. 1.—*Chalk Marl.*

21. T. *extensus.*—Depressed, conical ; above rugged, obliquely striated ; beneath convex, smooth ; base expanded, with a broad undulated thin margin ; aperture oblong ; pillar-cavity not plicated, closed when old.—*Sower.* Min. Conch. t. cclxxviii. f. 2, 3.—*London Clay.*

22. T. *monilifer.*—Conical, transversely striated ; volutions rather convex, with three rows of tubercles, and crenated edges ; base slightly convex, bearing six rows of granules ; aperture quadrangular ; pillar-cavity, along one edge of the aperture, truncated. (T. nodulosus, Brander, Foss. Hant. f. 6.) —*Sower.* Min. Conch. t. ccclxvii.—*London Clay.*

23. T. *linearis.*—" Conical, wreaths slightly convex, transversely striated, with a prominent line along the centre and base of each volution ; base flat ; umbilicus obscured by the last volution ; aperture transversely depressed."—*Mantell*, Geol. Suss. 110. t. xviii. f. 17. *In grey chalk-marl.* Indications of three other species, from the same formation, are given by Mr Mantell, ib. t. xviii. f. 7. f. 9. and 16.

Gen. SOLARIUM.—Pillar cavity spreading, and crenulated at the margin of the whorls.

1. S. *patulum.*—Depressed, whorls smoothish ; margin keeled and crenulated ; margin of the cavity strongly denticulated. *Sower.* Min. Conch. t. xi. ; lower right hand figures.—*In London Clay.*

2. S. *discoideum.*—Discoid, outer edge sharply carinated ; edge of the pillar-cavity rounded, transversely wrinkled ; aperture obliquely elliptical, pointed at each end. *Sower.* Min. Conch. t. xi. ; upper right hand figures.—*London Clay.*

3. S. *conoideum.*—Conical, smooth ; aperture quadrangular ; pillar-cavity deep, narrow.—*Sower.* Min. Conch. t. xi. ; three middle figures.—*Upper Oolite.*

4. S. *canaliculatum.*—Convex, ornamented on both sides, with granulated unequal lines; edge prominent, crenated; pillar-cavity furrowed and crenated within; aperture round.—*Sower.* Min. Conch. t. dxxiv. f. 1.—*London Clay.*

5. S. *plicatum.* Convex, wrinkled, concentrically sulcated; pillar-cavity bounded by a more or less projecting crenated ridge. *Sower.* Min. Conch. t. dcxxiv. f. 2. *London Clay.*

Gen. LXI. IANTHINA.—Aperture triangular, pillar-lip straight, body-lip slightly convex and oblique. Foot with a buoyant spongy body.

290. I. *communis.*—Purple, striated transversely by the lines of growth; obsoletely striated spirally.

Cochlea marina Ianthina, *List.* Conch. t. dlxxii. f. 24.—Helix Ian. *Linn.* Syst. i. 1246. *Turt.* Conch. Dict. 58.—On the Irish coasts, not uncommon; rare in England.

Breadth and height about half an inch; fragile; whorls four, apex obtuse, the body-whorl subcarinated; outer-lip thin, pillar-lip a little reflected. When the animal is irritated, a purple fluid is ejected from the cellular margin of the cloak above the gills.—This species was added to our Fauna by the late Miss Hutchins, in consequence of recent specimens which occurred to her in Bantry Bay. It has since been found at several places on the coast of Ireland and west of England.

Gen. LXII. VELUTINA.—Aperture circumscribed, no pillar, body-lip oblique; foot simple.

291. V. *lævigata.*—Whorls three, transversely wrinkled, striated spirally.

Helix lævigata, *Linn.* Syst. i. 1250.—Bulla velutina, *Mull.* Zool. Dan. t. ci. f. 1, 4.—Helix haliotoides, Fab. Faun. Grœn. 390.—Helix læv. *Don.* Brit. Shells, t. cv. *Mont.* Test. Brit. 382.—In deep water, not rare.

Length $\frac{8}{10}$ths, breadth $\frac{6}{10}$ths of an inch; cuticle brown, rough, with regular equidistant spiral ridges; two first whorls minute, rounded; the body-whorl ventricose; aperture patulous, outer-lip thin, body-lip a little thickened, and slightly reflected; the inside of the aperture is frequently tinged with purple.

292. V. *Otis.*—Whorls three, smooth, transversely oblong.

Helix apertura patentissima, *Walk.* Test. Min. t. i. f. 17.—Helix Otis, *Turton*, Conch. Dict. p. 70.—Interstices of rocks covered at high water, Devonshire.

Length and breadth about a line; semitransparent, glossy; aperture transversely oblong; body-lip a little thickened and flattish.

293. V. *stylifera.*—Whorls five, smooth, longitudinally oblong.

Phasianella styl. *Turton*, Zool. Journ. No. 7. 367. t. xiii. f. 11.—At Torbay, attached to the spines of *Echinus esculentus.*

Length one line, breadth not so much; yellowish horn-coloured, transparent; the body-whorl very large, the others forming a short pointed spire; aperture suborbicular, the margin thin and incomplete on the body retrally.

—This species differs from the genus *Phasianella*, in which Dr Turton has placed it, by the absence of the lid; and it differs likewise from the *Velutina*, in the aperture being partly filled by the projection of the body-whorl; in the body-lip being incomplete retrally, and in possessing an imperfect pillar-lip. In the absence of the lid, the size of the body-whorl, and wideness of the aperture, it claims a place near *Velutina*, and should probably constitute a new genus.—Stylina.

EXTINCT SPECIES.

1. V. *canaliculata.*—Obovate convex, spirally striated; whorls three, lateral, adpressed, rounded; body-lip reflected, forming a large central cavity.—Sigaretus canaliculatus, *Sower.* Min. Conch. 384.—*London Clay.*

SOLENOSTOMATA.

I. *Shell convoluted. The whorls are small segments of large circles, wrapped round the pillar, the last formed one embracing or inclosing the preceding one: aperture lengthened.*

A. **Conusidæ.** Shell compressedly convoluted; aperture linear and simple, with a small lid. Proboscis long, tentacula produced, with the eyes near the summit, on the outside.
Conus.
Terebellum.
Seraphs.

B. **Cypræadæ.** Shell, involute; outer-lip incurved, plaited; no lid. Cloak enlarged, and capable of folding over the shell.
Cypræa
(Cypreovula.)

C. **Ovuladæ.** Shell involute; both extremities of the aperture ending in a canal. Cloak enlarged, and capable of folding over the shell.
(Ovula.)
Volva.
Calpurna.

D. **Volutadæ.** Shell with a single anteal canal, not produced; pillar with oblique folds.
Voluta.
Volvaria.
Mitra.
Cancellaria.

E. **Marginelladæ.** Outer-lip thickened; pillar plaited.
Marginella.
Columbella.

F. **Olivadæ.** A spiral callous ridge on the base of the body-whorl, joining the pillar.
Oliva.
Ancillaria.

G. **Tornatelladæ.** Canal circumscribed, effuse.
Tornatella.
Acteon.

H. **Bellerephon.** Involute, aperture transverse, simple, with a sinus in the outer-lip.

II. *Shell turrited; whorls subconical, slightly embracing.*

1. **Buccinidæ.** Shell truncated or rounded anteally; the canal scarcely produced beyond the anterior margin of the lip, and bent towards the left.
2. **Muricidæ.** Shell acuminated at the base; the canal produced beyond the anterior margin of the lip, and either straight or bent.
3. **Cerithiadæ.** Aperture of the shell oblique; canal short, truncated or recurved.
4. **Strombusidæ.** Outer-lip spreading with age, and having a notch or sinus near the commencement of the canal for the passage of the head.

CONUSIDÆ.

Gen. CONUS—Convoluted, inversely conical, spire short, composed of the upper edges of the whorls; aperture oblique, with parallel sides.

1. C. *dormitor*.—Short, fusiform, spirally striated, the intermediate species neatly crenulated.—(*Brander*, Foss. i. f. 24.)—*Sower.* Min. Conch. t. ccci.—*London Clay.*

2. C. *concinnus*.—Fusiform, angular in the middle, spire ornamented with knobs and granulated striæ; base produced, sulcated.—*Sower.* Min. Conch. t. cccii. f. 2.—*London Clay.*

3. C. *scabriusculus*.—Fusiform, rather short, striated; striæ elevated, toothed.—(*Brander*, Foss. f. 21.)—*Sower.* Min. Conch. t. ccciii.—*London Clay.*

Gen. TEREBELLUM. Convoluted, elongated; spire exposed, pointed; aperture longitudinal, narrow retrally, becoming broader and truncated anteally.

1. T. *fusiforme*.—Subfusiform, cylindrical, with a visible obtuse spire; aperture about ⅗ths of the length of the shell, with an adpressed straight canal, proceeding from its retral angle, to the apex of the space.—*Sower.* Min. Conch. t. cclxxxvii.—*London Clay.*

Gen. SERAPHS.—Convoluted, elongated, spire concealed; aperture longitudinal, retrally narrow, and extending to the apex.

1. S. *convolutus*.—Subcylindrical, apex obtuse; base truncated; the surface even.—(Bulla sopita, *Brander*, f. 29, a.—B. volutata, *ib.* f. 75.)—*Sower.* Min. Conch. t. cclxxxvi.

CYPRÆADÆ.

Gen. LXIII. CYPRÆA.—Involuted, ovate, spire concealed; aperture longitudinal, narrow; open at both ends; lips dentated.

294. C. *europea*.—Shell crossed by numerous smooth striæ; no dorsal groove; outer-lip thickened, longer than the inner.

Concha veneris, *List.* An. Ang. 168. t. iii. f. 17. Conch. t. dccvi. f. 57. Cypr. Pediculus, var. Eur. *Linn.* Syst. i. 1180. *Don.* Brit. Shells, t. xliii.—Cy. europea, *Mont.* Test. Brit. 200, and Supp. 88.—*E*, Nuns; *S*, Jonny Groat's Buckie.—Common in sandy bays.

Length about $\frac{5}{8}$ths of an inch; breadth $\frac{3}{8}$ths; of a pink colour with or without *(C. arctica)* dark dorsal spots; striæ distinct, bifurcated at the sides. In the young state, the shell is smooth, except some appearances of striæ on the inner-lip, and the apex exhibits two or three whorls,—in which state it is the *C. bullata* of Mont. Test. Brit. 202. t. vi. f. 1. The *C. pediculus* differs from the present species, with which it has been frequently confounded, by the roughness of the striæ, and the presence of a longitudinal dorsal groove.

◆

EXTINCT SPECIES.

1. C. *oviformis.*—Egg-shaped, tumid, smooth, slightly marginate; aperture widest at the lowest end, left side of the aperture obscurely toothed; right lip involute, tumid.—*Sower.* Min. Conch. t. iv.—*London Clay.*

2. C. *coccinelloides.*—Ovate sphæroidal, transversely striated; striæ numerous, acute, not interrupted; aperture slightly arched, not contracted in the middle.—*Sower.* Min. Conch. t. ccclxxviii. f. 1.—*Suffolk Crag.*

3. C. *retusa.*—Obovate, sphæroidal, transversely striated; striæ elevated, uninterrupted, few, remote; aperture a little curved at the narrowest end. —*Sower.* Min. Conch. t. ccclxxviii. f. 2.

4. C. *avellana.*—Obovate, sphæroidal, transversely striated; striæ numerous, remote, elevated, interrupted by a longitudinal sulcus; aperture a little curved at the narrowest end.—*Sower.* Min. Conch. t. ccclxxviii. f. 3.

OVULADÆ.

Gen. LXIV. VOLVA.—Canal at each extremity, produced; external lip simple.

295. V. *patula.*—Oblong, white, spirally striated; pillar with a shallow furrow.

Bulla patula, *Penn.* Brit. Zool. iv. 117. t. 70. f. 85, A. *Don.* Brit. Shells, t. cxliii. *Mont.* Test. Brit. 207.—North and South Britain, rare.

Length about an inch, breadth half an inch; outer-lip regularly rounded; inner-lip protuberant in the middle, twisted and subreflected retrally; back, rounded.

GEN. CALPURNA.—Canals abbreviated; external lip simple.

1. L. *Leathesi.*—Elliptical, elongated, rather ventricose in the middle; smooth; a large plait on the pillar; outer-lip smooth, very thick, and rather flattened.—Ovula Leath. *Sower.* Min. Conch. t. cccclxxviii.—In the *Crag* at Walton.

VOLUTADÆ.

GEN. LXV. VOLUTA.—Pillar plaited, the anteal folds the largest; extremity of the canal emarginate.

296. V. *catenata.*—Shell pellucid, white, with four spiral bands of opake white spots, connected by rufous streaks.

Mont. Test. Brit. 236. t. vi. f. 2.—Coast of Devon. *Mr Swainson*, Dundbar, *Mr Laskey.*

Length $\frac{2}{8}$ths, breadth $\frac{1}{8}$th, of an inch; shell strong, spire nearly concealed; body-whorl slightly conical; aperture the whole length of the shell; outer-lip obsoletely denticulated within; pillar-lip thick, with two strong and two faint folds.

EXTINCT SPECIES.

1. V. *luctator.*—Shell ovate-acute, covered with tubercular spines, terminating longitudinal ribs, transversely striated or sulcated; whorls concave above, with a rounded edge; outer lip plain within; aperture oblong.—(Strombus dubius, *Brander*, f. 68.)—*Sower.* Min. Conch. t. cxv. f. 1, and t. cccxcvii.—*London Clay.*

2. V. *spinosa.*—Ovate-acute, ventricose, covered with large spines, extending into the longitudinal ribs, and a row of smaller spines near the upper edge of the whorl; whorls concave above, transversely striated below; aperture ovate, elongated; outer-lip plain within.—(Strombus luctator, *Brander*, f. 56.) —*Sower.* Min. Conch. t. cxv. f. 2, 3, 4.—*London Clay.*

3. V. *suspensa.*—Ovate, pointed, obscurely costated, transversely striated; spire with a broad canal around it, bounded by an erect, flat, dentated crown; base produced.—(Murex suspensus, *Brander*, f. 70.)—*Sower.* Min. Conch. t. cxv. f. 5.—*London Clay.*

4. V. *costata.*—Ovato-fusiform, acute, costated, striated, with about three plaits on the pillar.—(*Brander*, f. 45.) *Sower.* Min. Conch. t. ccxc. f. 1, 2, 4.—*London Clay.*

5. V. *Magorum.* — Ovato-fusiform, obtuse, costated, obscurely striated; with many plaits upon the pillar.—*Sower.* Min. Conch. t. 290. f. 3.—*London Clay.*

6. V. *Athleta.*—Rhomboidal, ventricose, acute, crowned with large spreading spires; base obscurely sulcated; pillar with three unequal folds; lip plain within.—(Strombus Ath. *Brander*, f. 66.) *Sower.* Min. Conch. t. cccxcvi. f. 1, 2, 3.—*London Clay.*

7. V. *depauperata.*—Ovato-rhomboidal, acute, costated; crowned with one series of erect spines; base sulcated; pillar with one fold; lip smooth within. —(Strombus luctator, *Brander*, f. 67,) *Sower.* Min. Conch. t. cccxcvi. f. 4.—*London Clay.*

8. V. *ambigua.*—Shell ovato-elongated; acute, costated, transversely sulcated; costæ angular above; spire rough; pillar with three plaits; lip plaited within, its edge granulated, aperture narrow above.—(Strombus ambiguus, *Brander*, f. 69.) *Sower.* Min. Conch. t. cccxcix. f. i.—*London Clay.*

9. V. *nodosa*.—Ovate, pointed; obscurely costated, transversely sulcated; spire with two rows of nodiform spines; pillar with three folds; lip striated within.—*Sower.* Min. Conch. t. cccxcix. f. 2.—*London Clay.*

10. V. *geminata*.—Ovate, ventricose, pointed, costated; costæ terminated by two obtuse connected spines; pillar with one large and several small plaits, curved.—*Sower.* Min. Conch. t, cccxcviii. f. i. *London Clay.*

11. V. *Lima*.—Ovato-elongated, acute, costated, and transversely striated; costæ numerous, dentato-crenated; upper edges of the whorls toothed; pillar with three unequal folds; lip smooth within, its edge crenulated.—(Buccinum scabriusculum, *Brander*, f. 71.) *Sower.* Min. Conch. t. cccxcviii. f. 2.

GEN. LXVI. VOLVARIA.—Spire very short, aperture narrow, the length of the shell; pillar plaited; extremity of the canal effuse.

297. V. *pallida*.—Shell cylindrical, smooth, glossy, with four strong folds on the pillar.

List. Conch. t. DCCXIV. f. 70. outer fig.—Voluta pall. *Linn.* Syst. i. 1189. *Adams*, Linn. Trans. iii. 253.—Bulla pall. *Don*, Brit. Shells, t. lxvi.—Vol. pal. *Mont.* Test. Brit. 232.—English coasts, rare.

Length half an inch, breadth a quarter; separating line scarcely visible; outer lip straight, inner lip slightly concave at the pillar; the four teeth nearly of equal size.

298. V. *alba*.—Shell oval, white, faintly striate longitudinally; with two folds on the pillar.

Voluta alba, *Mont.* Test. Brit. 235. *Turton*'s Conch. Dict. 250.—Ireland and Scotland, rare.

Length about $\frac{1}{10}$th of an inch, breadth $\frac{2}{3}$ds less; oval, tapering to an obtuse point, whorls five or six, quite flat, and not visibly raised; the first very large, and occupying three-fourths of the shell; aperture narrow, oval; pillar quite smooth, sometimes a little spread.—This species, as described by Dr Turton, from specimens found in Dublin Bay, (and which, according to Mr Lowe, (Zool. Journ. ii. 106.) agree with those found at Oban in Argyleshire), seems to differ from the specimen described by Montagu, in the Supplement to Test. Brit. 103. as having been found by Mr Laskey at Dunbar, and which is stated as having four folds on the base of the pillar, besides some slight denticulations higher up.

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EXTINCT SPECIES.

1. V. *acutiuscula*.—Nearly cylindrical, with a pointed apex; spire concealed; striæ numerous, composed of squarish impressions; plaits upon the pillar variable.—*Sower.* Min. Conch. t. ccccIxxxvii.—*London Clay.*

GEN. MITRA.—Turrited, pillar plaited, the anteal folds the smallest; extremity of the canal emarginate.

1. M. *Lamberti*.—Fusiform, short, smooth; base elongated, obscurely truncated; pillar with three or four plaits; aperture acute above, outer lip sharp, not expanded towards the base.—Voluta Lamberti, *Sower.* Min. Conch. t. cxxix.—*Crag Marl.*

2. M. *scabra.*—Ovato-fusiform, rough, with decussating striæ; lip thickened with one obtuse tooth upon its margin.—This probably belongs to the genus *Collumbella.*—(Buccinum scabriusculum, *Brander*, f. 20.) *Sower.* Min. Conch. t. ccccі.—*London Clay.*

3. M. *parva.*—Ovate, fusiform, short, transversely sulcated; upper edges of the whorls defined, entire; aperture elongated, lip plaited within; four folds on the pillar.—*Sower.* Min. Conch. t. ccccxxx. f. 1.—*London Clay.*

4. M. *pumila.*—Ovate, fusiform, short, transversely sulcated; upper edges of the whorls defined, crenated; sulci decussated by longitudinal costæ; aperture elongated; lip, plaited within; four folds on the pillar.—*Sower.* Min. Conch. t. ccccxxx. f. 2.

GEN. LXVII. CANCELLARIA.—Last whorl subventricose; aperture ovate, ending in a short canal; pillar plaited.

299. C. *hyalina.*—Whorls six, smooth, folds of the pillar numerous.

Voluta hyalina, *Mont.* Test. Brit. Sup. 101. t. xxx. f. 1.—Found at Dunbar by Mr Laskey.

Length a quarter of an inch, breadth nearly two-thirds less; pellucid, white; whorls flat, scarcely defined by the separating line, tapering to an obtuse point; body-whorl more than half the length of the shell; aperture contracted retrally; outer lip nearly straight, smooth; folds of the pillar fine thread-like striæ, originating from behind the pillar-lip.

EXTINCT SPECIES.

1. C. *quadrata.*—Ovate elongated, cancellated, without either varices or beak; two obtuse plaits on the pillar, besides the spiral edge; outer lip sharp, entire, striated within.—*Sower.* Min Conch. t. ccclx.—*London Clay.*

2. C. *læviuscula.*—Short, ovate, pointed, furnished with varicose sutures and costæ, crossed by numerous obtuse elevated lines; pillar biplicated; aperture scarcely canaliculated.—*Sower.* Min. Conch. t. ccclxi. f. 1.—*London Clay.*

3. C. *evulsa.*—Short, ovate, pointed, furnished with varicose sutures and costæ, crossed by several acute carinæ, most elevated upon the costæ; pillar biplicated; aperture scarcely canaliculated.—(Buccinum evulsum, *Brander*, f. 14.) *Sower.* Min. Conch. t. ccclxi. f. 2, 3, 4,—*London Clay.*

The two last species evidently belong to the group indicated by Brander.

MARGINELLADÆ.

GEN. LXVIII. MARGINELLA.—Spire short; outer lip with an external border; pillar folds equal; no lid.

300. M. *voluta.*—Whorls two, greenish, the outer lip white.

Cypræa voluta, *Mont.* Test. Brit. 203. t. vi. f. 7.—Voluta lævis, *Don.* Brit. Shells, t. clxv.—Inhabits deep water, rare.

Length about half an inch, subconical, strong, smooth; aperture linear; both lips denticulated; pillar subplicated. The *Bulla diaphana* of Montagu, Test. Brit. 225. t. vii. f. 8. is regarded as the young of this species.

GEN. COLOMBELLA.—Aperture oblique; outer lip with an internal callus contracting the cavity; pillar plaited; no lid.

1. C. *Bartonensis.*—Shell oval, contracted close to the beak, strongly reticulated; whorls about four or five, the last about two-thirds the length of the shell; aperture elongated, curved, acute at both ends; right hand lip expanded, undulated, toothed within; left-hand lip smooth at the edge, toothed within.—Murex Bart. *Sower.* Min. Conch. t. xxxiv. lower figures.—*London Clay.*

2. C. *ventricosa.*—Subovate, inflated, transversely striated; spire short, pointed, base notched; three sharp plaits upon the pillar; body-lip callous.—Auricula vent. *Sower.* Min. Conch. 465. f. 1.—In the *Crag* at Ipswich.

3. C. *buccinea.*—Subovate inflated, smooth; spire short, acute; base notched; three sharp plaits upon the pillar; left lip callous; right lip with a thick border.—Auricula buc. *Sower.* Min. Conch. t. ccccIxv. f. 2.—In the *Crag* at Ramsholt.

OLIVADÆ.

GEN. OLIVA.—Shell subcylindrical; aperture longitudinal, emarginate; separating line canaliculated, by the inflection of the edge of the last whorl.

1. O. *Branderi.*—Ovate, pointed, smooth; spire prominent, last whorl convex; mouth oblong; right lip thickened.—(Voluta Ispidula, *Brander*, Foss. f. 72.) *Sower.* Min. Conch. t. cclxxxviii. upper figure.—*London Clay.*

2. O. *Salisburiana.*—Subfusiform, short, ventricose, smooth; mouth oblong, both lips tumid above.—*Sower.* Min. Conch. t. cclxxxviii. lower figures.—*London Clay.*

GEN. ANCILLARIA.—Shell oblong, subcylindrical; aperture longitudinal, effuse; separating line not canaliculated.

1. A. *aveniformis.*—Oval, elongated, smooth; spire acute; varix with two plaits; extension of the inner lip short; aperture little more than half the length of the shell, inner lip extended over about one-third of the exposed part of each whorl; surface shining.—*Sower.* Min. Conch. t. xcix. middle figures.—*London Clay.*

2. A. *turritella.*—Subcylindrical, with an acute subturrited spire, minutely and transversely striated; upper part of each whorl shining, middle minutely decussated; an obscure spiral sulcus near the varix; pillar with three plaits, and one deep sulcus.—*Sower.* Min. Conch. t. xcix. larger figures.—*London Clay.*

3. A. *subulata.*—Subulate, smooth and shining; spire and base polished; spire elongated, acute; the varix at the base of the pillar striated.—*Sower.* Min. Conch. t. cccxxxiii.—*London Clay* and *Upper Marine Formation.*

TORNATELLADÆ.

GEN. LXIX. TORNATELLA.—Body-lip simple; separating line canaliculated by the inflection of the edge of the whorl; with a corneous lid.

301. T. *tornatilis.*—Whorls eight; spirally striated; the pillar with one fold, near the retral extremity.

Buccinum parvum, *List.* Conch. t. dcccxxxv. f. 58.—Voluta tornatilis, *Linn.* Syst. i. 1187. *Mont.* Test. Brit. 231.—In Sandy bays.

Length ¾ths of an inch; purplish red, with two white spiral bands; body-whorl large, the others forming a short conical spine; aperture contracted behind by the projection of the body-whorl; outer lip thin, slightly rounded.

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EXTINCT SPECIES.

1. T. *Noæ.*—Oval, transversely striated; with one plait near the extremity of the pillar; striæ equidistant, numerous, impressed, obscurely decussated; lip sulcated within.—Acteon Noæ, *Sower.* Min. Conch. t. ccclxxiii.—In *Crag.*

2. T. *cuspidatus.*—Subcylindrical, smooth; spire immersed, cuspidated; one plait upon the pillar; aperture nearly the whole length of the body whorl.—A. cusp. *Sower.* Min. Conch. t. ccccl v.—*Oolite* at Ancliffe.

3. T. *acutus.*—Subcylindrical, smooth; spire conical acute; one plait upon the pillar.—A. acutus, *Sower.* Min. Conch. t. cccclv. f. 2.—At Ancliffe. Probably the young of the preceding.

4. T. *crenatus.*—Ovate, elongated, spirally striated; pillar minutely crenated.—A. cren. *Sower.* Min. Conch. t. cccclx. f. 1.—*London clay.*

5. T. *striatus.*—Ovate, acute, spirally striated; pillar without a plait; striæ not punctated.—A. str. *Sower.* Min. Conch. t. cccclx. f. 2.—*Crag.*

6. T. *elongatus*.—Elongated, obtuse, spirally striated; the last whorl nearly cylindrical; aperture short, narrow above; lip expanded; pillar without plait.—A. elon. *Sower.* Min. Conch. t. cccclx. f. 3.—*London clay*.—This shell is surely out of place in the present group.

Gen. LXX. ACTEON.—Body lip toothed; separating line simple.

302. A. *denticulatus*.—Whorls seven or eight; body lip with two folds; outer lip denticulated within.

Voluta dent. *Mont.* Test. Brit. 234, t. xx. f. 5.—On sea-weed near high water-mark, England.

Length half an inch, breadth not a quarter; horn colour; body whorl large, slightly rounded, the others forming a conical subproduced spire, all slightly wrinkled by the lines of growth; aperture oblong-oval, half the length of the shell; the body lip has one tooth less in size than the two on the pillar; the teeth in the outer lip vary in number, and in some young individuals are absent. The *Voluta ringens* and *reflexa* of Dr Turton (Conch. Dict. 251.) appear to be only varieties of *A. denticulatus*.

303. A. *bidentatus*.—Whorls six or seven; body lip with one tooth; outer lip simple.

Voluta bid. *Mont.* Test. Brit. Sup. 100. t. xxx. f. 2.—At Dunbar, Mr Laskey; Devonshire, Mr Montagu.

Length a quarter of an inch; white; strong, thick, conic, wrinkled by the lines of growth; body whorl about two-thirds, and the aperture about half the length of the shell; the last is narrow retrally; with the inner lip thickened and reflected.

304. A. *triplicatus*.—Whorls six, flat; body lip with two folds; outer lip simple.

Voluta trip. *Don.* Brit. Shells, t. cxxxviii. *Mont.* Test. Brit. Sup. 99. —Guernsey.

Length half an inch; ovate, smooth, chesnut-brown; the body whorl occupying three-fourths of the shell; aperture contracted retrally; the whorls of the conical spire are so flat as to be distinguished only by the separating line.

305. A. *fusiformis*.—Whorls four, flat, inner lip with a gibbosity in the middle.

Voluta fus. *Turt.* Conch. Dict. 251.—Exmouth, Mrs C. W. Luscombe.

"Shell glossy white, transparent, quite smooth, swollen in the middle, and tapering to both ends; spires four, very flat, and only defined by a fine lucid circular line, the first very large and occupying more than three-fourths of the shell, inflated in the middle and tapering towards the base, which is rounded and a little reflected; aperture oblong-oval, reaching to the top of the primary volution; the outer lip very thin and plain; pillar lip smooth, not spreading nor reflected, without teeth or folds, but furnished with a small oblique gibbosity in the middle: length $\frac{3}{10}$ths of an inch; breadth half its length."—Probably the type of a new genus.

306. A. *heteroclita*.—Whorls reversed.

Voluta heteroclita, *Laskey*, Wern. Mem. i. 398, t. viii. f. 1, 2. *Mont.* Test. Sup. 169.—Dunbar.

"Shell glossy, white, veined like ivory in a longitudinal direction, and furnished with eight or nine reversed volutions, slightly tapering to an obtuse point; the lower whorl occupies two-thirds of the shell; the aperture is narrow, not quite half the length of the shell; and the columella possesses one plication. Length a quarter of an inch; breadth one-third of its length." *Mont.*—This species, in all probability, is likewise the type of a new genus.

GEN. BELLEROPHON.—Shell spiral, involute, the last whorl enclosing the others; aperture arched, extremities simple, with a sinus in the middle of the outer lip.

* *With a mesial band.*

1. B. *hiulcus.*—Globose, expanded; closely striated, the striæ sharp, elevated, passing obliquely from the mesial band, which is flat, broad, with its sides defined by sharp depressed lines; a central cavity on each side.—Conchyliolithus Nautilites hiulcus, *Mart.* Pet. Derb. t. xl. f. 2.—Bel. hiulcus, *Sower.* Min. Conch. t. ccccIxx. f. 1.—*Carboniferous limestone*, Derbyshire.

2. B. *tenuifascia.*—Spherical, with a well defined central cavity, finely striated; mesial band linear, elevated.—Conch. Naut. hiulcus, var. *c. Mart.* Pet. Derb. p. 15.—B. ten. *Sower.* Min. Conch. t. ccccIxx. f. 2, 3.—*Carboniferous limestone*, Derbyshire and Yorkshire.

3. B. *costatus.*—Globose, expanded, subcarinated, with slender sharp ribs diverging from the undefined broad convex band; with a central cavity.—Conch. N. hiulcus, *Mart.* p. 15, t. xl. f. 1. *Park.* Or. Rem. iii. 141. t. x. f. 6, 7.—B. cost. *Sower.* Min. Conch. t. ccccIxx. f. 4.—*Carboniferous limestone*, Derbyshire.

4. B. *decussatus.*—Shell somewhat ovate longitudinally, with numerous spiral ridges, crossed by finer ones, giving the points of union a subtubercular aspect; mesial band rounded, longitudinally striated, decussated by the transverse fine ridges, which in crossing have a concave bend.—In my cabinet from *slate-clay of the coal formation*, Linlithgowshire.

5. B. *striatus.*—Longitudinally ovate; with numerous, fine, slightly rough, spiral ridges: mesial band slightly flattened, and longitudinally striated. This species differs from the last in the mesial band being more elevated, and in the nearly total absence of the transverse ridges. In one specimen there is a thick inner lip spreading on the surface of the last whorl.—From the same place as the last.

** *Destitute of a mesial band.*

6. B. *apertus.*—Nearly spherical; sides of the aperture expanded; shell smooth, thick; with a well defined central cavity.—*Sower.* Min. Conch. t. ccccIxix. f. 1.—In *Carboniferous Limestone*, Lowth. I have a specimen from carboniferous limestone in Linlithgowshire, agreeing in form with one presented to me by Mr Wright from Lowth.

7. B. *cornu-arietis.*—Elongated; sides of the aperture expanded; shell very thick, smooth, faintly marked by the lines of growth. The shell, when a little corroded, becomes coarse and laminated.—Nautilus, *Ure*, Hist. Ruth. 308. t. xiv. f. 8.—B. corn. *Sower.* Min. Conch. t. ccccIxix. f. 2.—Mr Sowerby's specimens are from *Limestone*, Kendal; mine are from *Carboniferous Limestone*, Linlithgowshire.

8. B. *Urii.*—Globular; sides of the aperture expanded; shell smooth, regularly sulcated spirally; the furrows shallow, the ridges rounded.—Nauti-

lus, *Ure's* Ruth. 308. t. xiv. f. 9.—In *Carboniferous Limestone.*—I have ventured to name this shell in memory of the Rev. David Ure, the author of the " History of Rutherglen and East Kilbride," a work which contains the best enumeration of the fossils of the independent coal formation which has yet been published in this country.

BUCCINIDÆ.

a. Right lip of the canal with a raised edge, and a groove behind; outer lip thickened, denticulated within; pillar lip thick, spreading or forming a longitudinal ridge.
- Cassis.
- *Morio.*
- Nasa.

aa. Right lip of the canal obsolete.
- *b.* Outer lip thickened.
  - (Ricinula.)
  - Purpura.
  - Monoceros.
  - (Concholepas.)
  - *Harpa.*
- *bb.* Outer lip plain.
  - Dolium.
  - Buccinum.
  - *Eburnea.*

GEN. LXXI. CASSIS.—Spire short; canal slightly produced and recurved.

307. C. *bilineata.*—Glossy brown, with spiral bands of brown spots.

List. Conch. t. DCCCCXCVIII. f. 63.—Buccinum decussatum, *Penn.* Brit. Zool. t. lxxix. lower figures.—B. porcatum, *Pult.* Dorst. 41.—B. bilin. *Mont.* Test. Brit. 244.—Weymouth, Mr Pennant; Dunbar, Mr Laskey; very rare.

Length from one to two inches; whorls five or six, the upper part set round with two series of tubercles; outer lip slightly toothed; pillar lip rugged and granular. In a young specimen which I received from the late Rev. James Lambert, Cambridge, as from Plymouth Sound, the whorls have numerous, fine, waved, spiral striæ. These are crossed by more numerous and fine longitudinal striæ, together with obsolete wrinkles of growth, which, on the top of the spires, constitute well defined subtubercular ridges. The white cover of the tube at the base of the pillar is finely granular.

EXTINCT SPECIES.

1. C. *bicatenata.*—Ovate, ventricose, with many depressed spiral ridges, decussated by small longitudinal costæ towards the upper parts of the whorls; aperture ovate; left lip obscurely tuberculated.—*Sower.* Min. Conch. t. cli. —*Crag.*

2. C. *striata.*—Shell ovate; spire acute; volutions oval, longitudinally striated, with one obscure nodose ridge; beak nearly straight.—*Sower.* Min. Conch. t. vi.; four lower figures.—*London Clay.*

GEN. MORIO.—Aperture longitudinal, narrow, ending in a recurved canal.

1. M. *carinatus.*—Shell pyriform; spire short; volutions depressed, angular, with many longitudinal striæ, and three nodose ridges.—(Buccinum nodosum, Brander, front. No. 131).—Cassis car. *Sower.* Min. Conch. t. vi.; the three upper figures.—*London Clay.*

GEN. LXXII. NASA.—Spire produced; canal very short, obliquely truncated.

308. N. *reticulata.*—Outer lip simple externally; the longitudinal ridges decussated by narrow, deep, spiral grooves.

Buc. cancellatum, *List.* Conch. t. DCCCCLXVI. f. 21.—B. reticul. *Linn.* Syst. i. 1204. *Penn.* Brit. Zool. iv. 122. t. lxxii. f. 92. *Mont.* Test. Brit. 240.—Not uncommon.

Length an inch and a half; breadth three quarters; of a brownish colour; whorls seven or eight, rather flat; aperture lengthened; outer lip nearly straight retrally; inner lip slightly tuberculated.—This shell is subject to slight variations in the relative size of the ribs.

309. N. *incrassata.*—Outer lip thickened by a strong external rib; whorls slightly rounded; longitudinal ridges decussated by narrow flattened spiral ridges.

Tritonium incrass. *Mull.* Zool. Dan. Prod. 244, No. 2946.—Buc. minutum, *Penn.* Brit. Zool. iv. 122. t. 79.—B. macula, *Mont.* Test. Brit. 241. t. viii. f. 4. Near low water-mark, common.

Length half an inch; breadth above a quarter; colour various, mottled; whorls six or seven; aperture orbicular; outer lip rounded, denticulated, with a short tooth at the junction with the margin of the canal; inner lip concave, faintly tuberculated; canal with a black end. Dr Turton notices two varieties, A having the outer lip thin, and not toothed on the inside, and B "with a notch or cut at the upper angle of the outer lip, separating it from its attachment to the body volution, similar to that which is found in the Murex gracilis."—Conch. Dict. 15. He has likewise described a very common variety of this shell, with the pillar white externally, under the title *Tritonia văricosa*, Zool. Journ. No. vii. 365. t. xiii. f. 7.

310. N. *ambigua.*—Outer lip thickened by a strong external rib; whorls slightly depressed towards the junction; the longitudinal ridges decussated by numerous spirâl striæ.

Buc. amb. *Pult.* Dorset. 42. *Mont.* Test. 242. t. ix. f. 7.—On the English and Irish coasts, not common.

Length half an inch, breadth three-eighths; white, whorls six, with from eleven to fifteen ribs; aperture suborbicular; outer lip denticulated, with an obsolete tooth at the canal; outer lip with two distant folds.

311. N. *cincta.*—Outer lip thickened by a strong external rib; whorls nearly even; interstices of the ribs obsoletely striated spirally.

Buc. cinctum, *Mont.* Test. 246. t. xv. f. 1.—Found at Weymouth, *Mr Bryer.*

Length about a quarter of an inch; white, with a rufous spiral band; whorls six or seven, closely ribbed; apex sharp; aperture oval, narrow; outer lip denticulated within; inner lip crenulated by the spiral striæ at the base.

312. N. *tuberculata.*—Outer lip simple externally; inner lip strongly marked with oblique striæ.

B. tuber. *Turt.* Conch. Dict. 16.—Found in the sand at Exmouth, *Mrs C. W. Luscombe.*

"Shell taper, white, but not glossy; spires six, rounded, and well defined by the line of junction, with numerous strong longitudinal ribs, crossed by fine transverse lines, giving them a tubercled appearance; aperture oval; the outer lip thin and toothed within; inner lip strongly marked with oblique striæ, and ending in a short, reflected, rather cloven canal; length six-tenths of an inch; breadth not a third of its length." *Turton.*

EXTINCT SPECIES.

1. N. *granulata.*—Shell ovate, pointed, transversely striated, and with twenty rows of longitudinal tubercles; outer lip thickened, many toothed within.—Buccinum gran. *Sower.* Min. Conch. t. cx. f. 4.—*In Crag, Ipswich.*

2. N. *canaliculata.* Ovato-elongated, transversely striated; spire costated; whorls separated by a canal; lip thickened, sharp, dentato-striated within. (Buc. desertum, *Brander*, f. 18, 19); B. can. *Sower.* Min. Conch. t. ccccxv. f. 2. *London Clay.*

GEN. LXXIII. PURPURA.—Shell strong; aperture ovate; outer lip flattened, denticulated; inner lip flattened; canal short, imbedded.

313. P. *Lapillus.*—Whorls six, spirally striated, with waved longitudinal striæ and wrinkles.

Buccinum minus, *List.* An. Ang. 158. t. iii. f. 5, 6. Conch. t. DCCCCLXV. f. 18, 19.—B. Lap. *Linn.* Syst. i. 1202. *Mont.* Test. Brit. 239.—Common in rocks below high water-mark.

Length from 1 to 2 inches; white, yellowish, or banded with brown or yellow; whorls slightly elevated, varying greatly in the spiral striæ or ridges, and likewise in the longitudinal markings, which last are sometimes scaly; aperture ovate; outer lip sloping outwards to a thin edge, the inner edge of the slope denticulated, and terminating abruptly at the canal; pillar-lip broad, the pillar slightly concave towards the base; in young shells the outer lip is thin.—This species is very destructive to mussel beds, by perforating the shell, in order to feed on the contained animal.

EXTINCT SPECIES.

1. P. *crispatum.*—Ovate, acuminated, roughened by imbricated, concave scales, placed upon numerous close transverse carinæ; whorls convex; lip subdentated; beak subcanaliculated. — Buc. crisp. *Sower.* Min. Conch. t. ccccxiii.—*Crag.*

2. B. *tetragonum.*—Squarish, ovate, pointed, costated; costæ crossed by four large and several small ridges; aperture oblong; lip toothed within.—Buc. *Sower.* Min. Conch. t. ccccxiv. f. 1.—*Crag.*

3. P. *incrassatum.*—Thick; ovate, pointed, ridged; with about five carinæ, the uppermost largest; aperture oval; lip obscurely furrowed within.—Buc. *Sower.* Min. Conch. t. ccccxiv.—*Crag.*

4. P. *desertum.*—Ovate, oblong, costated, transversely striated; whorls contracted above by a rounded canal; lip striated within.—(Buc. Brander) f. 15. *Sower.* Min. Conch. t. ccccxv. f. 1.—In *London Clay.*

GEN. LXXIV. MONOCEROS.—Aperture longitudinal, emarginate retrally; pillar reflected, with a tooth at the canal.

314. M. *hepaticus.*—Whorls eight, with longitudinal ridges, and a spiral tuberculated ridge at the top of each whorl.

Buc. hep. *Pult.* Dorset 41. *Mont.* Test. Brit. 243. t. viii. f. 1.—On the English and Irish coast, rare.

Length an inch, breadth five-eighths; colour brownish, sometimes spotted; whorls tumid, strongly divided, smooth, striated at the base of the body-whorl; outer lip thick, turning inwards to a denticulated edge.

GEN. HARPA.—Aperture ovate, lips smooth; canal patulous on the right; pillar flattened, and pointed at the base; whorls with longitudinal ridges.

1. H. *Trimmeri.*—A fragment of a fossil species referred to the genus Harpa, from " its parallel compressed and obliquely inclined ribs, with the pointed angle at their summit, and the smooth columella," by Mr Parkinson, was found in a stratum of dark pyritous clay (probably *London Clay?*) at Brentford, on the premisses of Messrs Trimmers.—Org. Rem. iii. 59.

GEN. LXXV. DOLIUM.—Shell ventricose; aperture longitudinal, patulous on the right; spiral ridges entering the inner lip.

315. D. *Perdix.*—Ovate, spiral ridges depressed, and broader than the intervening spaces.

Buc. striatum fuscum, *List.* Conch. t. DCCCCLXXXIV. f. 43.—B. Perdix, *Linn.* Syst. i. 1137. *Pult.* Dorset. 41. *Mont.* Test. Brit. 244. t. viii. f. 5.—On the English coast, rare.

English specimens of the size of a nut; yellowish-brown, mottled with white; aperture ovate; outer lip thin, inner pillar lip reflected, forming a cavity behind.

EXTINCT SPECIES.

1. D. *nodosum.*—Obovate, ventricose, with spiral rows of obtuse knobs. Cast of a species of Dolium?—*Mant.* Suss. 196.—D. nod. *Sower.* Min. Conch. t. ccccxxvi. ccccxxvii.—*Upper Chalk.*

GEN. LXXVI. BUCCINUM.—Shell ovate, aperture longitudinal; canal slightly edged obliquely on the left; pillar rounded, somewhat gibbous and bent anteally.

316. B. *undatum.*—Whorls seven or eight, ventricose, with

spiral ridges and intermediate striæ, crossed by the lines of growth, and waved furrows on the upper whorls.

B. crassum rufescens, *List.* An. Ang. 156. t. cxi. f. 2, 3. Conch. t. cccclxii. f. 14, 15. *Linn.* Syst. i. 1204.—B. und. and striatum, *Penn.* Brit. Zool. 121. t. lxxiii. f. 90, t. lxxiv. f. 91.—B. und. *Mont.* Test. Brit. 237.—Common beyond low water-mark.

Length from 3 to 5 inches, breadth upwards of 2; shell white, sometimes tinged with brown or pink, the cuticle is brown, with numerous longitudinal ridges of short hairs; whorls rounded; the body whorl of the female large in proportion; the spiral ridges are crossed by the lines of growth.—This species is used as a bait, and caught in baskets in which carrion is placed.

317. B. *glaciale.*—Whorls nine, tapering, obsoletely striated spirally, finely striated longitudinally; upper whorls with longitudinal waved furrows, the body whorl with a spiral ridge.

Linn. Syst. i. 1204. *Don.* Brit. Shells, t. cliv.—In the north seas, rare.

Length about 2 inches, breadth less than 1; white, with a reddish tinge, the keel on the body whorl vanishes on the superior ones; this shell is more produced, and the longitudinal furrows better marked, than in the preceding species.—It appears to have been found in Orkney by Mr Agnew, gardener to the Duchess of Portland. I possess a slightly mutilated specimen, which I found in Zetland.

318. B. *carinatum.*—Shell oblong, oval; whorls seven, thin, inflated with an elevated circular rib at the top of each, from which they suddenly slope to the separating line.

Turt. Conch. Dict. 13. t. xxvi. f. 94.—Irish coast, Mr O'Kelly and Mr Tardy.

Length 4¼ inches, breadth 2½; white, with a broad rufous band round the middle of each whorl; spirally and longitudinally striated, with obsolete longitudinal ribs; the body whorl is swollen, but the upper ones are flattened; aperture dilated; outer lip with a thick edge, inner lip smooth and spread on the pillar.

319. B. *anglicanum.*—Shell thin; whorls eight, strongly striated spirally with waved longitudinal ridges on the upper part of the whorls; lower part of the body whorl nearly smooth.

List. Conch. t. dcccclxiii. f. 17.—B. ang. *Lam.* Syst. vii. 264.—B. Humphreysianum, *Bennet*, Zool. Journ. i. 398. t. xxii.—Zetland and Cork.

Length 2 inches, breadth 1 inch; shell white; the cuticle brown, pilose, sometimes with reddish-brown spiral bands; whorls slightly rounded, and a little depressed above towards the separating line; the spiral striæ seem to vary in size as well as the longitudinal furrows, in different specimens; the striæ produced by the lines of growth are numerous and fine; aperture ovate; pillar smooth or wrinkled.—In 1809, I found two specimens of this shell in Zetland, in a fishing-boat, brought from deep water; those described by Mr Bennet were found in the harbour of Cork by Mr Humphreys.

320. B. *ovum.*—" Shell oval, inflated, thin, ivory white, smooth; volutions six, tumid; outer lip thin and smooth.

Turton, Zool. Journ. ii. 366. t. xiii. f. 9.—Plymouth Sound.

Length an inch and three quarters, breadth rather more than an inch. —Only one specimen has occurred.

321. B. *pictum.*—" Shell oval, oblong, glossy, whitish, with ochraceous blotches; volutions eight, decussate; outer lip smooth."

Purpura picta, *Turt.* Zool. Journ. ii. 365. t. xiii. f. 8.—British Channel.

" Length $\frac{4}{10}$ths of an inch, breadth hardly two; termination of the pillar pointed."—Judging from the drawing, the aperture seems subquadrangular lengthened, with the outer lip nearly straight in the middle.

322. B. *lineatum.*—Shell smooth, glossy, with numerous spiral bands of brown and white.

Da Costa, Brit. Conch. p. 130, t. viii. f. 5. *Pult.* Dorset. 41. *Don.* Brit. Shells, t. xv. *Mont.* Test. Brit. 245.—B. pediculare, *Lam.* Syst. vii. 275.—Southern coasts of England.

Length $\frac{2}{8}$ths, breadth $\frac{1}{8}$th of an inch; conic, strong; towards the base of the body whorl the narrow white bands become excavated into spiral striæ; aperture oval, outer lip a little spreading.—It is very common among West Indian shells.

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The following shells, being probably the fry of different species, may here be noticed, though the descriptions and accompanying figures of the authors referred to be very imperfect.

a. B. *obtusulum.*—Whorls three, bellied, aperture oval; colour opake white. —*Walk.* Test. Min. 16. t. xi. f. 59.—Faversham.

b. B. *breve.*—Whorls five, longitudinally ribbed, transversely striated, opake; canal short.—*Adams*, Linn. Trans. iii. 64. t. xiii. f. 3, 4.—Pembrokeshire.

c. B. *minutum.*—Whorls three, longitudinally ribbed; opake, white.—*Adams*, Linn. Trans. iii. 64. t. xiii. f. 5, 6.—Pembrokeshire.

d. B. *læve.*—Whorls three, smooth, body whorl large; aperture oval; canal lengthened.—*Adams*, Linn. Trans. iii. 64. t. xiii. f. 7, 8.—Pembrokeshire.

e. B. *obtusissimum.*—Whorls three, smooth; aperture contracted; canal lengthened.—*Adams*, Linn. Trans. iii. 65. t. xiii. f. 9, 10.—Pembrokeshire.

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EXTINCT SPECIES.

1. B. *elongatum.*—Shell ovate-elongated, transversely striated; whorls 7, rather convex, longitudinally undulated; outer lip obscurely crenulated within; mouth oval, with a short recurved canal.—*Sower.* Min. Conch. t. cx. f. 1.—*Crag.*

2. B. *rugosum.*—Shell ovate-elongated, obtuse, transversely striated; spire with 12 or 14 angles; whorls five, prominent; aperture obovate; latter whorl rugged.—*Sower.* Min. Conch. t. cx. f. 3.—*Crag* at Holywell.

3. B. *reticosum.*—Shell oblong-ovate, acute, reticulated; whorls 6, with the upper and lower parts rounded, and sides flattish; outer lip toothed within.—*Sower.* Min. Conch. t. cx. f. 2.—*Crag* at Holywell.

4. B. *ulcatum.*—Turreted, acute, transversely furrowed; whorls ventricose; aperture ovate; lip toothed within, thickened by age.—*Sower.* Min. Conch. t. cclxxv. f. 2, and t. cccclxxvii. f. 4.—In *Crag*, Ramsholt,

5. B. *labiatum.*—Ovate, acuminated, costate, transversely striated; striæ numerous, large, elevated, and rounded; whorls convex; aperture oblong; its outer lip enlarged in the middle, and striated within.—*Sower.* Min. Conch. t. ccccxii. f. 1, 2. (Is not this *B. defossum* of Pilkington, Linn. Trans. vii. 117. t. xi. f. 2. ?)—*Upper Marine Formation.*

6. B. *lavatum.*—Ovate acuminated, costated, furnished with many acute carinæ, and transversely striated; aperture oblong; lip crenulated at the edge, and striated within; whorls convex (Brander, f. 16.).—*Sower.* Min. Conch. t. ccccxii. f. 3, 4.—In *London Clay.*

7. B. *propinquum.*—Ovate, pointed, longitudinally costated; costæ divided into tubercles by many transverse sulci, the uppermost of which is very broad; aperture obovate.—*Sower.* Min. Conch. t. cccclxxvii. f. 2.—In *Crag.*

8. B. *labiosum.*—" Ovate pointed, straightish on the sides, transversely sulcated; lip broad and relieved; aperture oblong, pointed above."—*Sower.* Min. Conch. t. cccclxxvii. t. 3.—In *Crag.*

9. B. *Dalei.*—Ovate, smooth, or slightly sulcated; whorls very convex above; apex of the spire obtuse.—*Sower.* Min. Conch. t. cccclxxxvi. f. 1, 2. —*Crag.*

10. B. *tenerum.*—Ovate, acute, thin, coarsely striated; spire undulated; beak antiquated; whorls convex.—*Sower.* Min. Conch. t. cccclxxxvi. f. 3, 4.

GEN. EBURNEA.—Shell ovate; aperture longitudinal; canal an oblique notch; pillar grooved, perforated.

1. Mr Parkinson refers a shell, from Essex, to this genus, under the title *E. glabrata* (Organic Rem. p. 59, t. v. f. 25.), though he observes that it differs " in having the columella hardly umbilicated." It will probably prove a variety of *Buccinum Dalei* of Sowerby.

MURICIDÆ.

a. Right lip simple.
  b. Pillar plaited.
    (Turbinella.)
    (Fasciolaria.)
    Terebra.
  bb. Pillar simple.
    Pyrula.
    Fusus.
    Pleurotoma.
aa. Right lip marginated by the last formed of the varicose ribs.
  b. Ribs continuous over the whorls.
    (Ranella.)
    Murex.
    Typhis.
  bb. Ribs interrupted.
    Triton.

GEN. LXXVII. TEREBRA.—Shell turrited, long in proportion to the aperture; canal short, the pillar twisted, or turning obliquely to the left.

323. T. *fuscata.*—Whorls twelve, with three or four spiral tuberculated ridges; base spirally striated.

Bucc. fuscum, *List.* Conch. t. cxxii. f. 18.—Murex fusc. *Linn.* Syst. i. 1225.—Turbo tubercularis, *Penn.* Brit. Zool. iv. 129. t. lxxxii. f. *111.—Murex fuscatus, *Pult.* Dorset. 43. *Mont.* Test. Brit. 269.—English coast, rare.

Length an inch and a half, breadth $\frac{4}{10}$ths; brown; whorls flat, increasing gradually; separating line with a spiral fold above it; spiral ridges unequal; some tubercles of the middle ridge, at irregular distances, swollen, the furrows minutely striated spirally, and finely wrinkled by the layers of growth; striæ flattened; base crenulated; aperture longitudinal; pillar smooth, canal short and shallow.—I have given the above description from specimens sent me as English by Dr Leach. I am at a loss, however, to comprehend the nature of the shell which the authors of the descriptive catalogue have figured in Linn. Trans. viii. t. iv. f. 6. It is surely unconnected with this species.

324. T. *tubercularis.*—Whorls ten, with three series of spiral tubercles of equal size; the canal partly covered by the incumbent pillar lip.

Murex tub. *Mont.* Test. Brit. 270.—South coast of England.

Length a quarter of an inch; chesnut-brown; whorls slender, tapering, separated only by a slight depression; apex pointed; aperture small, oval.—A white variety occurred to Mr Laskey at Dunbar.

325. T. *reticulata.*—Whorls twelve, with four spiral ridges intersected by slightly oblique longitudinal furrows.

(Strombiformis reticulatus, *Da Costa*, Brit. Conch. 117. t. viii. f. 13.)—Murex reticulatus, *Pult.* Dorset. 43. *Mont.* Test. Brit. 272.—In sandy bays, but rare.

Length ⅝ths of an inch, breadth upwards of ⅛th; brown; whorls strong, slender; separating line minute, above which is a broad furrow, apparently marking the division of the whorls; base with obsolete spiral grooves; aperture ovate, canal short and shallow.

326. T. *subulata.*—Whorls fifteen, with two spiral rows of beads divided by a depressed line.

Murex sub. *Mont.* Test. Brit. Sup. 115. t. xxx. f. 6.—Sound of Mull, near Scalasdale, Mr Laskey.

Length ⅜ths of an inch; whorls slender, little raised, defined by a purplish-brown spiral line; spiral furrows longitudinally striated; base smooth, and of a dark brown colour; aperture small.

327. T. *perversa.*—Whorls ten, sinistral, tuberculated.

Turbo Turritus perversus, *Walk.* Test. Min. Rar. 13. t. xi. f. 48.—Murex adversus, *Mont.* Test. Brit. 271.—Turbo reticulatus, *Don.* Brit. Shells, t. 159.—On different places of the coast, rare.

Length half an inch, breadth ⅛th; brown; whorls with three spiral rows of tubercles, the middle row the smallest; base with two or three spiral ridges; aperture oval, canal deep.

EXTINCT SPECIES.

1. T. *cornucopiæ.*—Turrited, subulated, punctated; whorls very numerous, superior ones with three or four unequal tuberculated carinæ, central ones tuberculated above, undulated below, with four or five transverse furrows; lowest whorls crossed by nine or ten elongated tubercles; aperture quadrate; columella plaited; beak short, curved.—Cerithium corn. *Sower.* Min. Conch. t. cxxxviii. f. 1, 2. 4.—*London Clay.*

2. T. *gigantea.*—Turreted extremely long, spirally striated, minutely punctated; upper parts of the whorls tuberculato-nodose.—Cerithium gig. *Sower.* Min. Conch. t. cxxviii. f. 2.—*London Clay.*

3. T. *cincta.*—Subulate conical, with three rows of nearly equal granules upon each whorl, and two carinæ near the edge of the base; suture subcanaliculated; pillar with one plait.—Potamides cinctus, *Sower.* Min. Conch. t. cccxl. f. 1.—*Upper Marine Formation*, Headon Hill.

GEN. LXXVIII. PYRULA.—Spire short, body-whorl ventricose retrally; right margin of the canal patulous.

328. P. *carica.*—Shell pyramidal, heavy; body-whorl with a single spiral row of triangular processes.

List. Conch. t. DCCCLXXX. f. 3. 6.—Murex carica, *Turt.* Conch. Dict. 86. t. viii. f. 26.—Coast of Ireland.

Length 6 inches, breadth 4; reddish-grey; irregularly striate, and somewhat scaly lengthwise, near the base a few spiral striæ; whorls six, hardly raised, with a row of seven or eight protuberances on the last, decreasing into tubercles in the upper ones, the upper whorls are spirally striate; outer lip with the margin angular at the termination of the row of hollow protuberances; pillar-lip polished. Dr Turton states, that a pair of these magnificent shells were thrown upon the sands at Warren's Point, after a severe thunder storm.

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EXTINCT SPECIES.

1. P. *nexilis.*—Obovate, clavate, with decussating elevated striæ; spiral striæ uniform, most prominent; spire slightly produced.—(Murex nexilis, *Brander*, f. 55.) *Sower.* Min. Conch. t. cccxxxi.—*London Clay.*

2. P. *Greenwoodii.*—Pyriform, with a short produced spire, reticulated with scattered elevated striæ; beak pointed; shell thin.—*Sower.* Min. Conch. t. ccccxcviii.—*Crag.*

Two species are noticed as figured by Brander, whose work I have no opportunity of consulting, viz. f. 52, 53, and 54, which last is by Parkinson (Org. Rem. 67.) considered as agreeing with *Pyrula lævigata* of Lamark, while Mr Mantell (Geol. Suss. 268.) denominates it *P. bulbiformis,*—f. 52, 53, the *Murex pyrus* of Brander. These two species occur in the London Clay.

GEN. LXXIX. FUSUS.—Shell pisiform, ventricose in the middle, spire produced; right margin of the canal patulous.

* *Whorls destitute of longitudinal ribs.*

329. F. *antiquus.*—Whorls eight, ventricose, with obsolete waved spiral striæ, crossed by longitudinal wrinkled lines of growth.

Bucc. album. læve, *List.* An. Ang. 155. t. iii. f. i. Conch. t. DCCCCXIII. f. 4.—Murex antiquus, *Linn.* Syst. i. 1222.—M. despectus, *Penn.* Brit. Zool. iv. 124. t. lxxviii.—M. antiquus, *Mull.* Zool. Dan. t. cxcviii. *Don.* Br. Sh. t. xxxi.—M. desp. *Mont.* Test. Brit. 256.—In deep bays, common.

Length from 4 to 6 inches, greatest breadth between 2 and 3; white, the inside with a yellowish tinge; cuticle absent; whorls thick, rounded, rather coarse on the surface; aperture ovate, the outer lip thin at the edge, inner lip smooth, canal short, nearly straight. The animal is white, with a corneous pyriform lid. It is used as a bait for cod, and sometimes as food. The shell, suspended horizontally, is employed in the Zetland cottage as a lamp, the cavity containing the oil, and the canal the wick. Dr Turton mentions (Conch. Dict. 69.) two varieties in the shell; the first with the whorls nearly separated, and the second leaving the whorls furnished with longitudinal ribs: in a specimen which I possess, the whorls are prominently angular in the middle, and the specimen bears a close resemblance to the figure of *Buccinum carinatum* of the Conchological Dictionary.

330. F. *corneus.*—Shell lengthened, spirally striated; the canal produced and slightly recurved.

Buccinum angustius, *List.* An. Ang. 157. t. iii. f. 4. Conch. t. DCCCCXIII. f. 5. —Murex corneus, *Linn.* Syst. i. 1234. *Penn.* Brit. Zool. iv. 124. t. lxxvi. f. 99. *Don.* Brit. Shells, t. xxxviii. *Mont.* Test. Brit. 258. —In sandy bays, common.

Length 3 inches, breadth about 1; shell white, usually covered with a thick brown epidermis; whorls nine, compressed with a deep separating line;

spiral striæ unequal, slightly wrinkled longitudinally; aperture oblong, outer lip thin, the canal bent to the left.—Specimens resembling this shell are found in what is supposed to be the upper marine formation of the Suffolk coast, and figured in the Mineral Conchology, t. xxxv. It is probable that they belong to marine diluvium of the modern epoch.

331. F. *despectus.*—Shell ventricose with two carinated spiral ridges.

Murex desp. *Linn.* Syst. i. 1222.—M. carinatus, *Penn.* Brit. Zool. iv. 123. t. lxxvii. f. 96. *Don.* Brit. Shells, t. cix.—M. duplicatus, *Ib.* t. cxix.—M. cor. *Turt.* Conch. Dict. 88. t. xxvii. f. 95.—Scottish and Irish coasts, rare.

Length about 3 inches; white; strong; whorls eight, the body one occupying half the shell, faintly striated spirally, with irregular longitudinal lines of growth; upper part of each whorl depressed; ridges even or waved; aperture suborbicular.—This is probably nothing more than a variety of the *F. antiquus.*

332. F. *retroversus.*—Whorls five, sinistral, rounded, smooth and glossy.

Flem. Wern. Mem. iv. 498. t. xv. f. 2.—In shell sand from Noss Island, Zetland, collected after a storm in the spring of 1809.

Length about a line; translucent; whorls increase rapidly, giving the shell a bellied appearance; aperture oblong, outer lip joining the body at an acute angle; pillar straight, slightly scooped out at the apex for the canal, which is shallow, regular, and short; lines of growth scarcely perceptible.

** *Whorls with longitudinal ribs.*

333. F. *turricola.*—Whorls seven, compressed, flattened on the top, the ribs bending inwards to the separating line.

Murex turricola, *Mont.* Test. Brit. 262. t. ix. f. 1.—M. angulatus, *Don.* Brit. Shells, t. 156.—In deep water, not uncommon.

Length $\frac{3}{4}$ths, breadth $\frac{1}{4}$th of an inch; white, or slightly rufous; turrited; whorls with about twelve longitudinal ribs, crossed by spiral striæ; aperture narrow, ending in a wide canal, outer lip slightly thickened, inner lip smooth and broad.

334. F. *proximus.*—Whorls six, slightly flattened at the top; the outer lip remarkably broad and reflected.

Murex prox. *Mont.* Test. Brit. Sup. 118. t. xxx. f. 8.—Dunbar, Mr Laskey.

Length nearly half an inch; strong; white; whorls slightly compressed; deeply divided at the separating line; destitute of spiral striæ; aperture ovate, oblong; the canal short, and rather spreading at the end.

335. F. *costatus.*—Whorls six, with nine longitudinal, oblique, raised, and slightly waved ribs, destitute of spiral striæ.

Murex costatus, *Penn.* Brit. Zool. iv. 125. *Don.* Brit. Shells, t. cxi. *Mont.* Test. Brit. 265.—In sandy bays, not common.

Length about $\frac{3}{10}$ths of an inch, glossy brown or yellowish white, with fine spiral brown streaks that look like striæ; whorls rather flat; aperture narrow, terminating in a canal very little more contracted than the rest of the mouth, outer lip thick.

336. F. *septangularis.*—Whorls seven, strong, with seven continuous obtuse longitudinal ridges, the intervening spaces broad, shallow, and smooth.

Murex sept. *Mont.* Test. Brit. 268. t. ix. f. 5. *Don.* Brit. Shells, t. clxxix. f. 4.—In deep water, rare.

Length $\frac{5}{8}$ths of an inch, breadth $\frac{2}{8}$ths ; glossy purplish-brown ; whorls tapering, nearly even, the ridges scarcely interrupted by the separating line ; aperture oblong-oval, ending in a short canal, outer lip sharp at the edge.

337. F. *attenuatus.*—Whorls eight, smooth, nearly flat, with nine strong equidistant ribs.

Murex att. *Mont.* Test. Brit. 266. *Turt.* Conch. Dict. 91.—English and Irish coasts, rare.

Length $\frac{1}{2}$ an inch, breadth about $\frac{1}{8}$th ; yellowish-white ; slender, tapering to a fine point ; ribs undulated as they rise in the middle of each volution ; aperture narrow, contracting a little at the canal, outer lip thickened at the back.

338. F. *nebula.*—Whorls eight, strongly ribbed longitudinally, finely striated transversely ; canal slightly bent to the left.

Murex neb. *Mont.* Test. Brit. 267. t. xv. f. 6.—In sandy bays, not uncommon.

Length about half an inch, breadth $\frac{2}{10}$ths ; yellowish-white or rufous ; ribs nearly continuous across the thread-like separating line ; aperture narrow oblong-ovate, outer lip sharp.

339. F. *rufus.*—Whorls six, longitudinal ; ribs sixteen, spirally striated ; canal short and straight.

Murex rufus, *Mont.* Test. Brit. 263.—In deep water, rare.

Length $\frac{3}{10}$ths of an inch, breadth $\frac{1}{8}$th ; colour brown ; whorls slightly rounded ; aperture ovate, outer lip thin, inner lip broad and smooth.

340. F. *minimus.*—Whorls five, longitudinal ; ribs ten, strongly striated spirally ; canal short, outer lip striated internally.

Buccinum minimum, *Mont.* Test. Brit. 247. t. viii. f. 2.—B. brunneum, *Don.* Brit. Shells, t. clxxix. f. 2.—In deep water, rare.

Length $\frac{2}{10}$ths of an inch, breadth about $\frac{1}{10}$th ; brown ; whorls slightly rounded ; aperture oval ; canal straight, and very short.

341. F. *linearis.*—Whorls seven, strong ribbed, with elevated spiral striæ ; outer lip crenated internally.

Murex lin. *Mont.* Test. Brit. 261. t. ix. f. 4.—M. elegans, *Don.* Brit. Shells. t. clxxix. f. 3.—In sandy bays, rare.

Length $\frac{2}{8}$ths, breadth $\frac{1}{8}$th ; brown, streaked with purple ; whorls rugose, rounded ; apex pointed ; ribs about ten in number ; aperture oval, terminating in a straight canal ; outer lip thickened externally.

342. F. *accinctus.*—Whorls seven, ribs bent in the middle, finely striated spirally.

Murex acc. *Mont.* Test. Brit. Sup. 114. *Laskey.* Wern. Mem. i. 402. t. viii. 14.—In deep water in the Frith of Forth, where only one specimen occurred to Mr Laskey.

Length 4 lines, breadth 1 line; yellowish-white, with an obsolete brown band (consisting of four coloured lines) on the middle of the body-whorl, continuing to the apex; the ribs are highest at the middle of the whorl; aperture oblong; canal short.—This species is frequently to be met with among West Indian shells.

343. F. *gyrinus.*—Whorls four, with numerous spiral rows of brown tubercles.

Murex gyr. *Mont.* Test. Brit. Sup. 170. *Laskey*, Wern. Mem. 401. t. viii. f. 10.—Frith of Forth, Mr Laskey.

Length $\frac{2}{8}$ths, breadth $\frac{1}{8}$th of an inch; brown; strong, short, conic, and tumid; eight rows of tubercles on the body-whorl, and three on the preceding one.

344. F. *purpureus.*—Whorls ten, tapering; ribs twenty, oblique, with sharp spiral ridges.

Murex purp. *Mont.* Test. Brit. 260. t. ix. f. 3.—In deep bays, rare.

Length $\frac{5}{8}$ths of an inch, breadth $\frac{2}{8}$ths; purple; apex pointed; the spiral ridges are numerous, rising into angles on the ribs, giving the shell a very rough appearance; aperture narrow, oval, terminating in a strait canal; outer lip thin; pillar obliquely striated, and somewhat tuberculated.

345. F. *muricatus.*—Whorls seven, tapering, ribs numerous, crossed by strong raised spiral striæ; canal slender, long.

Murex mur. *Mont.* Test. Brit. 262. t. ix. f. 2.—In deep water, rare.

Length $\frac{1}{2}$ an inch, breadth $\frac{1}{4}$; epidermis red, shell white or flesh coloured; aperture oval, outer lip sharp, crenulated within; pillar smooth.

346. F. *chordula.*—Whorls five, with fifteen wire-like ribs, continuous, and bending in the middle towards the outer lip; spirally striated.

Murex chordula, *Turt.* Conch. Dict. 94.—In drifted sand, Dublin Bay.

Length 2 lines, breadth $\frac{2}{3}$ds less; brown; conic; a little tapering to a rather obtuse point; whorls rounded, the first occupying more than half the length; aperture narrow, oval, ending in a short canal; outer lip thickened by a rib on the back.

347. F. *Barvicensis.*—" Shell ventricose, white, with longitudinal furbelowed ribs, continued obliquely across a flattened space at the sutures; beak rather long, slightly ascending."

Dr Johnston, Edin. Phil. Journ. vol. xiii. 221.—Sea coast, near Berwick.

" Shell white, half an inch long, and one-half as broad, with six whorls, divided by a flattened space, and longitudinally ribbed. There are thirteen ribs on the body-whorl, finely furbelowed, projecting a little at the suture, terminating on the beak, which is produced and smooth towards its extremity. The indented appearance of the ribs is produced by obsolete transverse striæ crossing them. The ribs do not terminate at the sutures, but are continued across by elevated striæ. Aperture round, inclining to oval, with smooth lips.

348. F. *Bamfius.*—Whorls six, aperture rounded, canal produced and bent.

Murex Bamf. *Don.* Brit. Shells, t. clxix. f. i. *Mont.* Test. Brit. Sup. 117.—Sandy bays.

Length about ¾ths of an inch, breadth upwards of ¼th; white, or rufous; whorls rounded, with numerous transverse plaits, which, in young shells, are raised and sharp, especially at the separating line; in some cases there are indistinct spiral ridges; outer lip rounded, inner lip concave; base attenuated; canal slightly turned to the left.

EXTINCT SPECIES.

1. F. *longævus.*—Ventricose, smooth, spire turrited, with a few large knobs upon the upper part of the latter whorls; beak as long as the spire, slightly curved near the end.—(Murex longævus, *Brander*, f. 40, 70. and 93.) *Sower.* Min. Conch. t. lxiii.—In *London Clay.*

2. F. *bifasciatus.*—Elongated, rugosely reticulated; whorls keel-formed; base produced.—*Sower.* Min. Conch. t. ccxxviii.—In *London Clay.*

3. F. *acuminatus.*—Elongated, acicular, obscurely costated, and longitudinally striated; whorls tumid, with eight or ten elevated striæ.—(Murex porrectus, *Brander*, f. 36.) *Sower.* Min. Conch. t. cclxxiv. f. 1, 2, 3.—*London Clay.*

4. F. *asper.*—Elongated, costated; whorls tumid; costæ decussated by four or five elevated, rather acutely knotted, striæ or ridges.—*Sower.* Min. Conch. t. cclxxiv. f. 4–7.—*London Clay.*

5. F *porrectus.*—Elongated, subcancellated, with many prominent costæ; volutions tumid, with about eight elevated striæ upon each.—(M. porrectus, *Brander*, f. 35.) *Sower.* Min. Conch. t. cclxxiv. f. 8, 9.—*London Clay.*

6. F. *bulbiformis.*—Ovate, ventricose, nearly smooth; spire mucronated; beak obscurely striated, gently curved.—(Murex bulbus, f. 54. and M. Pyrus, f. 52, 53. *Brander.*) *Sower.* Min. Conch. t. ccxci. f. 1–6.—*London Clay.*

7. F. *ficulneus.*—Ovato-fusiform, turgid, costated; whorls subspinose above; base striated; back twisted; pillar uniplicated.—(Murex herzedus, *Brander*, f. 51.)—*Sower.* Min. Conch. t. ccxci. f. 7.—*London Clay.*

8. F. *errans.*—Oblong-ovate, conical at both ends, transversely striated; whorls bicarinated; upper carina largest.—(Strombus errans, *Brander*, f. 42.)—*Sower.* Min. Conch. t. cccc.—*London Clay.*

9. F. *regularis.*—Rather elongated with many longitudinal undulations, crossed by strong elevated striæ; whorls convex, the last contracted towards the beak, open, rather slender; aperture obovate.—(M. antiquus, *Brander*, f. 74.)—*Sower.* Min. Conch. t. clxxxvii. f. 2, and t. ccccxxii. f. 1.—*London Clay.*

10. F. *complanatus.*—Ovato-fusiform; pointed, costated, and transversely striated; superior edges of the whorls elevated, and pressed upon the spire; striæ contiguous; pillar curved.—*Sower.* Min. Conch. t. ccccxxiii, f. 2, 3.—*London Clay.*

11. F. *Lima.*—Ovato-fusiform, pointed, carinated; upper edges of the whorls elevated, and pressed upon the spire; carinæ many, acute, the central ones decussated by small sharp costæ; lines of growth acute.—*Sower.* Min. Conch. t. ccccxxiii. f. 4.—*London Clay.*

12. F. *coniferus.*—Elongated, with many longitudinal undulations; crossed by numerous unequal elevated striæ; whorls few, inversely conical, their upper parts depressed, and nearly smooth; beak open, rather short, aperture ovate.—*Sower.* Min. Conch. t. clxxxvii. f. 1.—*London Clay.*

13. F. *carinella*.—Rather elongated, with many longitudinal undulations, crossed by strong elevated unequal striæ; whorls convex, subcarinated in the middle, the last contracted towards the beak; beak open, rather slender; aperture obovate.—*Sower.* Min. Conch. t. clxxxvii. f. 3, 4.

14. F. *striatus*.—Shell ventricose, with many transverse rounded projections, and from three to five parallel striæ between each, crossed by other striæ or sutures; whorls from three to six; beak nearly straight; aperture oval.—Murex striatus, *Sower.* Min. Conch. t. xxii. A variety occurs in which three or four of the spiral ridges are more prominent than the rest, especially the upper ones, t. cxix.—In *Crag.*

15. F. *contrarius*.—Whorls reversed, five or six, slightly expanded at the upper part, and contracted towards the beak: surface with many rounded projections, or smooth; aperture irregularly ovate; beak rather short.—Murex con. *Park.* Org. Rem. t. vi. f. 5.—*Sower.* Min. Conch. t. xxiii.—In *Crag.*

16. F. *rugosus*.—Spire acute, of about six whorls, rather gibbose, with about ten longitudinal undulations, that intersect many deepish transverse striæ; beak nearly straight, lip thick; canal rather broad.—Murex rug. *Park*, Org. Rem. iii. p. 64. t. v. f. 16.—*Sower.* Min. Conch. t. xxxiv., upper figures, and t. cxix. f. 1, 2.—In *Crag.*

17. F. *trilineatus*.—Shell elongated, with many transverse projecting narrow bands, each obscurely divided into three threads; whorls five or six; beak straight, pointed; aperture elongated, several folds within the outer lip.—Murex tril. *Sower.* Min. Conch. t. xxxv. f. 4, 5.—*London Clay.*

18. F. *latus*.—Shell slightly ventricose, smooth, covered with alternately large and small transverse linear projections; whorls five, upper part of each undulated; aperture strongly striated within; beak straight, expanded, truncated.—Murex latus, *Sower.* Min. Conch. t. xxxv. left hand lower figure. —*Plastic Clay*, Plumstead.

19. F. *costellifer*.—Subturrited, transversely striated, longitudinally costated; whorls rather ventricose; aperture ovate, expanded towards the beak; beak very short, spreading; costæ numerous, slender.—Murex cost. *Sower.* Min. Conch. t. cxix. f. 3.—In *Crag.*

20. F. *echinatus*.—Turrited; whorls round, reticulated, with acute tubercles upon the angles of the meshes; outer-lip striated within, beak short.—Murex ech. *Sower.* Min. Conch. t. cxix. f. 4.—In *Crag.*

21. F. *curtus*.—Ovate, pointed, subventricose, longitudinally ribbed, transversely striated; aperture oval; beak short, recurved; whorls internally striated with elevated lines.—Murex curt. *Sower.* Min. Conch. t. cxix. f. 5.—*London Clay.*

22. F. *gradatus*.—Ventricose, longitudinally ribbed, transversely striated; spire short, acute; costæ varicose above; aperture oval, with a short expanded beak.—Murex grad. *Sower.* Min. Conch. t. cxix. f. 6.—*Plastic Clay*, Plumstead.

23. F. *interruptus*.—Subturrited; body covered by broad transverse sulci; the remaining whorls smooth, with two sulci along their upper edges.—Murex int. *Pilkington*, Linn. Trans. vii. 117. t. xi. f. 5.—*Sower.* Min. Conch. t. ccciv. —*London Clay.*

24. F. *quadratus*.—Short, conical, transversely striated and obscurely bicarinated; base produced; beak short; aperture subrhomboidal.—Murex quad. *Sower.* Min. Conch. t. ccccx. f i.—*Green Sand.*

25. F. *peruvianus.*—Subfusiform, ventricose, smooth, with fifteen thin costæ; beak a little recurved.—Murex per. *Sower.* Min. Conch. t. ccccxxxiv. f. 1.—In *Crag.*

26. F. *alveolatus.*—Turrited; volutions ornamented with two spiral obtuse carinæ, crossed by thick ribs; beak half cylindrical, ribbed.—*Sower.* Min. Conch. t. ccccxxv. f. 1.—In *Crag*, Suffolk.

27. F. *cancellatus.*—Lanceolate, acute, covered with acute decussating ridges, with short spines at the points of their intersection; whorls ventricose; aperture oblong, produced into a short beak.—*Sower.* Min. Conch. t. ccccxxv. f. 2.—In *Crag.*

Gen. LXXX. PLEUROTOMA.—Shell turrited, canal straight; a gutter or notch at the junction of the outer-lip with the body-whorl.

349. P. *gracilis.*—Whorls ten; ribs interrupted at the separating line by a depressed spirally striated space; canal produced.

Murex gracilis, *Mont.* Test. Brit. 267. t. xv. f. 5.—M. emarginatus, *Don.* Brit. Shells, t. clxix. f. 2.—In deep water, not common.

Length an inch, breadth a quarter; yellowish-white, with light coloured and brown bands; whorls tapering, little rounded, with numerous obtuse longitudinal ribs, crossed by well defined spiral striæ; aperture ovate, the outer-lip slightly crenulated by the spiral striæ; canal rather open, but produced in consequence of the bending in of the outer-lip, giving to the base an acuminated aspect.

350. P. *sinuosa.*—Whorls six, longitudinal ribs slightly interrupted by a depressed space at the separating line.

Murex sin. *Mont.* Test. Brit. 264. t. ix. f. 8.—In deep water, rare.

Length ¾ths of an inch, breadth a quarter, white, strong; whorls slightly compressed, and a little flattened at the top of each; ribs numerous, elevated, bent at the angle of the flattened space, and diminishing towards the separating line: regularly striated spirally; aperture oblong, oval; canal open; very short, in consequence of the outer-lip continuing entire; the base has a blunt aspect. In a specimen which I found in Zetland, the spiral striæ are strong, giving the shell a coarsely reticulated appearance.

EXTINCT SPECIES.

1. P. *attenuata.*—Fusiform, base attenuated; longitudinally undulated; undulations five or six, with a large compressed tubercle at the upper end of each; volutions transversely striated; aperture narrow, straight.—*Sower.* Min. Conch. t. cxlvi. f. 1.—*London Clay.*

2. P. *exorta.*—Turrited, base conical, elongated; whorls concave and smooth above, below, longitudinally undulated and convex, with many elevated subtuberculate dlines; aperture ovate, elongated, canaliculated.)—Murex exortus, *Brander*, f. 32.—(*Sower.* Min. Conch. t. cxvi, f. 2.)—*London Clay.*

3. P. *rostrata.*—Fusiform, with many transverse ridges and short costæ, volutions obscurely decussated, expanded, and slightly concave above, rather ventricose and roughish below: aperture elongated, canaliculated.—(Murex ros. *Brander*, f. 34.)—*Sower.* Min. Conch. t. clxvi. f. 3.—*London Clay.*

4. P. *acuminata.*—Turrited, acuminated, longitudinally ribbed, transversely striated; whorls above, concave, edge fimbriated; below, sulcato-striated; aperture elongated, canaliculated, one-third the length of the shell; beak broad.—*Sower.* Min. Conch. t. cxlvi. f. 4.—*London Clay.*

5. P. *comma.*—Turrited, beaked with acute transverse rising lines; whorls smooth in the middle, with many short curved costæ; aperture ovate, canaliculated; beak slightly curved.—*Sower.* Min. Conch. t. cxlvi. f. 5.—*London Clay.*

6. P. *semicolon.*—Turrited, elongated, striated, with many curved costæ; whorls swelled with a granulated margin, base conical, decussated; aperture ovate, beaked.—*Sower.* Min. Conch. t. cxlvi. f. 6.—*London Clay.*

7. P. *colon.*—Fusiform, striated; whorls concave above, with a crenulated margin below, with many rugged transverse ridges and small short longitudinal undulations; base conical, aperture elongated.—*Sower.* Min. Conch. t. cxlvi. f. 7, 8.—*London Clay.*

8. P. *priscus.*—Fusiform, turrited, smooth; base transversely sulcated; margins of the whorls striated; lip wing-shaped. (Murex priscus, *Brander*, f. 25, 44.)—*Sower.* Min. Conch. t. ccclxxxvi.—*London Clay.*

9. P. *fusiformis.*—Fusiform, elongated, rough, with deep transverse striæ, and obscure longitudinal costæ; whorls subcarinated, with a striated band upon their upper parts; aperture lanceolate.—*Sower.* Min. Conch. t. ccclxxxvii. f. 1.—*London Clay.*

10. P. *brevirostrum.*—Turrited, acute, costated, transversely striated; aperture obovate, with a defined beak of equal length; whorls ventricose.—*Sower.* Min. Conch. t. ccclxxxvii. f. 2.—*London Clay.*

11. P. *lævigata.*—Turrited, nearly smooth; spire subcostated; whorls ventricose, concave above; aperture elongated; beak produced.—*Sower.* Min. Conch. t. ccclxxxvii. f. 3.—*London Clay.*

GEN. MUREX.—Oval, aperture suborbicular, canal produced; ribs tubercular or spinose, three or more united obliquely on different whorls.

1. M. *asper.*—Ovate, oblong, transversely striated; sutures in three rows, foliaceous, dentated, bearing one spine upon the upper part of each; aperture obovate; canal recurved.—(*Brander*, f. 77, 78, 79.)—M. tricarinatus, *Sower.* Min. Conch. t. ccccxvi. f. 1.—*London Clay.*

2. M. *bispinosus.*—Ovate, elongated, with three rows of foliaceous sutures and two or three transverse ridges; sutures simple, bearing two concave spines to each whorl; canal nearly straight.—*Sower.* Min. Conch. t. ccccxvi. f. 2.—*London Clay.*

8. M. *frondosus.*—Ovate, oblong; sutures in eight or nine rows, subspinose, deeply plaited; transverse ridges numerous, rough; aperture obovate; canal straight.—*Sower.* Min. Conch. t. ccccxvi. f. 3.—*London Clay.*

4. M. *calcar.*—Ovato-acuminated, transversely striated, costated; last whorl bicarinated; each suture supports two or three long sharp spines; aperture round, with a long canal.—*Sower.* Min. Conch. t. ccccx. f. 2.—*Green Sand.*

5. M. *tortuosus.*—Turrited, subfusiform, largely cancellated; varices in three tortuous rows, with two or three knobs between each; whorls ventricose; beak contracted.—*Sower.* Min. Conch. t. ccccxxxiv. f. 2.—In *Crag?*

GEN. TYPHIS.—Oval, aperture suborbicular, canal short, covered; whorls with numerous tubular pervious processes.

1. T. *fistulosus.*—Oblong, varicose; each varix foliated and produced above in a recurved tube; aperture obovate, entire; beak nearly straight, closed.—(Murex pungens, *Brander*, f. 82.)—M. fist. *Sower.* Min. Conch. t. clxxxix. f. 1, 2.—*London Clay.*

2. T. *tubifer.*—Ovate, with four rows of erect tubes alternating with four solitary tubes upon each whorl; aperture obovate, entire; beak arched, closed.—(Murex pungens, *Brander*, f. 81.)—T. tubifer, *Park*, Org. Rem. iii. 65. t. v. f. 15.—*London Clay.*

GEN. LXXXI. TRITON.—Ovate, oblong; canal produced, subascending, or bent to the left; ribs alternate or remote, not continuous on the whorls.

351. T. *erinaceus.*—Whorls eight, with seven rugose, longitudinal ribs crossed by strong spiral striæ.

Murex er. *Penn.* Brit. Zool. iv. 123. t. lxxvi. f. 95. *Don.* Brit. Shells, t. xxxv. *Mont.* Test. Brit. 259.—Rocky shores.

Length nearly 2 inches, breadth 1 inch; brown; strong; whorls angular, sloping abruptly at the junctions, with imbricated arched scales; aperture oval; canal subtubular; outer-lip striated internally, pillar-lip smooth.

◆

EXTINCT SPECIES.

1. T. *tuberosus.*—Ovate, pointed, transversely striated, with many blunt short costæ upon each whorl; base convex.—Murex tub. *Sower.* Min. Conch. t. ccxxix. f. 1.—*London Clay.*

2. T. *minax.*—Short, transversely striated; spire tuberculated, acute; last whorl ventricose, with two rows of tubercles; the upper ones spiniform, furrowed; base sulcated; beak curved.—Murex-minax (Brander, f. 62.) *Sower.* Min. Conch. t. ccxxix. f. 2.

3. T. *cristatus.*—Ovate, transversely striated; longitudinal costæ prominent, sharp, with three large plaits in each, the upper plait subspiniform; beak curved.—Murex crist. *Sower.* Min. Conch. t. ccxx. f. 1, 2.—*London Clay.*

4. T. *coronatus.*—Oblong, transversely furrowed; costæ numerous, sharp; upper part of the volutions concave, bounded by a sharp ridge and a strong spine upon each of the costæ. Murex cor.—*Sower.* Min. Conch. t. xxiii. f. 3.—*London Clay.*

5. T. *argutus.*—Ovate, pointed, costated, spirally striated; costæ knotted; striæ many, elevated, several of them large; varices few; whorls inflated beyond each varix; aperture toothed; beak ascending.—Murex varg. (Brander, f. 13.) *Sower.* Min. Conch. t. cccxliv.—*London Clay.*

6. T. *alveolatus.*—Ovate acuminated; surface divided into square cells by many acute sutures that decussate eight or ten prominent carinæ; whorls ventricose, flattened above; aperture oval; the outer lip toothed within.—Murex alv. *Sower.* Min. Conch. t. ccccxi. f. 2.—In *Crag.*

7. T. *defossus.*—Ovate acuminated, smooth; whorls ventricose, bearing many obtuse carinæ; sutures numerous, acute, linear; aperture elongated, with many lamelliform teeth within its outer lip.—Buccinum def. *Pilk.* Linn.

Trans. vii. 117. t. xi. f. 2.—Murex def. *Sower.* Min. Conch. t. ccccxi. f. 1.—In *London Clay.*

8. T. *sexdentatus.*—Ovate acuminated, costated, longitudinally striated, transversely carinated; whorls convex; aperture elongated, with five or six teeth within its outer lip.—Murex sex. *Sower.* Min. Conch. t. ccccxi. f. 3.—*Marine formation*, Colwell Bay, Isle of Wight.

CERITHIADÆ.

a. Marine.
  Cerithium.
  (Strutheolaria.)
aa. Fluviatile.
  Potamedum.
  Melanopsis.
  (Pirena.)

GEN. LXXXII. CERITHIUM.—Outer margin of the aperture rounded, with an obsolete canal, in many species, at its retral junction with the body-whorl.

352. C. *costatum.*—Whorls ten, a spiral line at the base of each, becoming double on the body-whorl.

(Strombiformis costatus, Da Costa, Brit. Conch. 118. t. viii. f. 14.) Strombus cost. *Don.* Brit. Shells, t. xciv. *Mont.* Brit. Shells, 255.—English coast, rare.

Length about half an inch; brown; tapering to a fine point; transverse ribs numerous, rounded, slightly waved; aperture ovate; the outer lip a little expanded; inner lip smooth; canal very short and patulous.

353. C. *turbiforme.*—Whorls seven, destitute of a thread-like spiral line at the base of each.

Mont. Test. Brit. Sup. 110. t. xxx. f. 7.—Found by Mr Laskey on the shores of Nun's Island, Iona.

Length about a quarter of an inch; breadth two-thirds less; brown; aperture white; whorls well-defined by the separating line; transverse ribs about eighteen; base smooth; aperture suborbicular; outer lip thickened at the margin, and a little spreading.

EXTINCT SPECIES.

1. C. *pyramidalis.*—Pyramidal, with six projecting tuberculated angles; whorls ten or eleven, transversely tricarinated, carinæ tuberculated; six compressed tubercles on the upper part of the last whorl; outer lip expanded.—(Murex angulatus, Brander, f. 46.) *Sower.* Min. Conch. t. cxxvii. f. 1.—*London Clay.*

2. C. *geminatum.*—Conical, elongated, smooth, with seven or eight longitudinally disposed pairs of acute tubercles on each whorl; whorls about twelve, lip even. *Sower.* Min. Conch. t. cxxvii. f. 2.—*London Clay.*

3. C. *funatum.*—Conical, elongated, with two obtuse crenulated transverse ridges upon each whorl; upper part of each whorl thickened and tuberculated; mouth squarish; base smooth. *Sower.* Min. Conch. t. cxxviii.—In *Plastic Clay.*

4. C. *funiculatum.*—Pyramidal; sides straight; whorls with four, nearly equal, crenulated carinæ on each; base with several plain elevated ridges. *Sower.* Min. Conch. t. cxlvii. f. 1, 2.—*Plastic Clay.*

5. C. *intermedium.*—Pyramidal, sides straight; whorls with a largely crenulated margin, and five or six unequal carinæ on each; base with several elevated ridges. *Sower.* Min. Conch. t. cxlvii. f. 3, 4.—*Plastic Clay.*

6. C. *dubium.*—Turrited; whorls with a row of compressed tubercles near the middle, and two transverse rows of lesser tubercles below; base with one or two rows of tubercles. *Sower.* Min. Conch. t. cxlvii. f. 5.—*London Clay.*

7. C. *melanoides.*—Turrited, obscurely longitudinally undulated; whorls convex, bearing above the middle a large tuberculated carina, below with two or three transverse tuberculated carinæ; beak very short. *Sower.* Min. Conch. t. cxlvii. f. 6, 7; and t. 339. f. 3.—*Plastic Clay.*

8. C. *rigidum.*—Subulato-conical, nearly smooth; lower whorls surrounded by a keel near their upper parts. (Buccinum. rig. Brander, f. 43.)—Potamidis reg. *Sower.* Min. Conch. t. 338.—*London Clay.*

9. C. *concavum.*—Subulato-conical; spirally striated; whorls rather concave towards the upper part; costated; costæ obscure, arched, with a slight eminence above the middle of each; base with one or two granulated carinæ, convex; lip enlarged below, with a small groove in its upper angle.—Potamides con. *Sower.* Min. Conch. t. cccxxxix. f. 1, 2.—*Upper marine formation*, Isle of Wight.

10. C. *margaritaceum.*—Conical, turrited, five close rows of bead-like granules surround each whorl, the first and fourth rows minute, the fifth larger than the other two; lip expanded, plicated; pillar recurved, obtusely carinated.—Potamides marg. *Sower.* Min. Conch. t. cccxcix. f. 4.—*Upper marine formation*, Isle of Wight.

11. C. *plicatum.*—Subulato-conical, or subcylindrical; whorls longitudinally plaited, transversely sulcated and striated; sulci three or four; base convex; lip crenulated.—Potamides plic. *Sower.* Min. Conch. t. cccxl. f. 2.—*Upper marine formation*, Isle of Wight.

12. C. *duplex.*—Subulato-conical, with two rows of tubercles upon the upper, and three upon the lower whorls; upper rows of tubercles largest; sides of the whorls flat; base flat, with two carinæ near its edge; beak short, inner edge rising upon the pillar.—Potamides duplex, *Sower.* Min. Conch. t. cccxl. f. 3.—*Upper marine formation*, Isle of Wight.

GEN. POTAMIDUM.—Canal very short; aperture entire retrally; outer-lip patulous.

1. P. *acutum.*—Conical, turrited; whorls convex, bicarinated; carinæ acute; base convex, bistriated; aperture orbicular, with a narrow short beak, *Sower.* Min. Conch. t. cccxli. f. 2.—*Lower fresh water formation*, Isle of Wight.

2. P. *ventricosum.*—Conical, turrited; whorls ventricose, costated, transversely striated; striæ two or three upon each whorl, most elevated upon the costæ; aperture orbicular, with an extremely short beak.—*Sower.* Min. Conch. t. cccxli. f. 1.—*Fresh water formation*, Isle of Wight and Cowes.

GEN. MELANOPSIS.—Canal short, emarginate; aperture produced, and ending in a gutter retrally; outer lip entire; pillar-lip callous.

1. M. *fusiformis.*—Fusiform in the middle, subcylindrical, smooth, mouth half the length of the shell.—*Sower.* Min. Conch. t. cccxxxii. f. 1, 7.—*Upper marine formation*, Isle of Wight, &c.

2. M. *subulata.*—Conical-subulate, smooth; mouth ovate, one-third the length of the shell, *Sower.* Min. Conch. t. cccxxxii. f. 8.—Along with the last species; the relations of both imperfectly understood.

3. M. *carinata.* Ovate, acuminated, with a sharp carina wound round the spire. *Sower.* Min. Conch. t. ccccxxiii. f. 1.—*Fresh water formation*, Isle of Wight and Cowes.

4. M. *brevis.* Ovate, pointed, short; whorls ventricose; contracted in their upper parts; aperture oval; inner lip thick, callous, not very prominent, *Sower.* Min. Conch. ccccxxiii. f. 2.—*Fresh water formation*, Hampshire coast.

STROMBUSIDÆ.

(Strombus.)
(Pterocera.)
Rostellaria.

GEN. LXXXIII. ROSTELLARIA.—Shell turrited; canal produced, and somewhat subulate; lip entire or dentated, with the notch contiguous to the canal.

354. R. *Pes-pelecani.*—Whorls ten, with tubercular spiral ridges, and fine striæ; outer lip quadrifid.

Buccinum, *List.* Conch. t. DCCCLXV. f. 20. t. DCCCLXI. f. 21, 6. Strombus Pes-pelecani, *Linn.* Syst. 1207. *Penn.* Brit. Zool. iv. 122. t. lxxv. f. 94. *Mont.* Test. Brit. 253. In sandy bays.

Length about two inches; white, more or less tinged with brown; whorls nearly flat, except in the middle, where the spiral tuberculated ridge runs; the separating line is well defined; the tubercles are oblong, transverse, and oblique. Besides the primary ridge, which extends over all the whorls, there are two or three on the base; aperture narrow; outer lip much expanded into three principal angular points, ridged on the back, and grooved in front, with a projecting wing retrally attached to the whorls; canal shallow, subulate. Animal with a long pink, coloured snout, spotted with white; tentacula filiform; foot short, white; eyes black at the base of the tentacula beneath.

EXTINCT SPECIES.

1. R. *lucida.* Fusiform, longitudinally ribbed, transversely striated; lip thick, with an obscure sinus at the inferior edge, and a very short channel at the superior; beak straight, short. *Sower.* Min. Conch. t. xci. f. 1, 2, 3. *London Clay.*

2. R. *rimosa.* Fusiform, whorls slightly convex, longitudinally ribbed, transversly striated; lip reflected, with a sinus at the inferior edge, below an expansion of the margin, and a canal at the superior edge, extending nearly the length of the spire; beak straight. (*Murex rimosus*, Brander, f. 27.)—*Sower.* Min. Conch. t. xci. f. 4, 5, 6.—*London Clay.*

3. R. *macroptera.*—Fusiform, smooth; lip large, nearly circular, with a canal extending along the spire; beak straight, pointed. (*Strombus amplus*, Brander, f. 76.) *Sower.* Min. Conch. t. ccxcviii, ccxcix, ccc.—In *London Clay.*

4. R. *Parkinsonii.*—Subfusiform; whorls seven or eight; convex, with longitudinal ribs, and numerous transverse striæ; outer lip dilated; armed with one styloid process, beneath which is a broad truncated expansion. Rostellaria, *Park.* Organic Remains, iii. 63. t. v. f. 11. R. Park. Mantell. Suss. 72, and 108. t. xviii. f. 1, 2, 4, 5, 6, 10.—In *Green Sand and Grey Chalk-marl.*

5. R. *Sowerbii.*—Turrited, costated, transversely striated; last whorl tricarinated; aperture expanded, with a one-angled entire lip; superior canal short.—R. Parkinsonii, *Sower.* Min. Conch. t. cccxlix. f. 1, 5.—*London Clay.*

6. R. *calcarata.*—Turrited, costated, transversely striated; costæ linear, curved; last whorl carinated; outer lip furnished with a large oblong process, the upper angle of which is formed into a long curved spire; beak pointed; superior canal obtuse. *Park.* Org. Rem. iii. 63. t. v. f. 2.—*Sower.* Min. Conch. t. cccxlix. f. 6, 7.—*Green Sand.*

GEN. LXXXIV. SIGARETUS.—Shell patulous, imbedded in the cloak, the anterior sinistral margin of which is notched at the branchial opening; tentacula two, with the eyes at the external base.

355. S. *haliotoideus.*—Tentacula short, flat, the foot rounded behind.

Bulla hal. *Mont.* Test. Brit. 211, Shell t. vii. f. 6, Animal vig. 2. f. 6.—In deep water, not common.

Shell $\frac{6}{8}$ths in length, and $\frac{4}{8}$ths of an inch in breadth; oval, depressed, pellucid, whitish, wrinkled by the lines of growth; whorls two, the first very small, forming the rudiment of a spire near the margin, the second rapidly increasing and forming a shallow basin; outer lip thin, inner lip concave, and slightly inflected. Animal oval, convex; skin tough; cloak broad, divided from the foot by a groove; mouth in the form of a short proboscis.

356. S. *tentaculatus.*—Tentacula produced, filiform; the foot pointed behind.

Lamellaria tentaculata, *Mont.* Linn. Trans. xi. 186. t. xii. f. 5, 6.—Coast of Devon.

Shell more depressed and opake than the preceding. Animal suborbicular, depressed, convex above, yellowish, with sulphur coloured and black spots; foot ovate, broad; the breadth about three quarters of an inch.

PECTINIBRANCHIA.

SCUTIBRANCHIA.

Heart with two auricles traversed by the rectum; sexes incorporated; body covered with a patulous shell; the foot destitute of a lid.

I. Shell ear-shaped, with a lateral and nearly concealed spire.
  Haliotis.
  (Padola.)
  (Stomatia.)

II. Shell oblong or conical, simple or subrevolute.

Crepidulidæ. Cavity of the shell interrupted by a testaceous plate.

a. Marine.

b. Plate of the cavity spirally decurrent.
  Calyptræa.
  Infundibulum.

bb. Plate of the cavity horizontal.
  Crepidula.
  Pileolus.

aa. Fluviatile.
  Navicella.

Capulidæ. Cavity and margin of the aperture entire.
  Capulus.
  (Carinaria.)

Fissurelladæ. Cavity entire; shell with a perforation or slit.
  Fissurella.
  Emarginula.

Scissurella.

HALIOTIDÆ.

Gen. LXXXV. **HALIOTIS.**—Left margin of the shell pierced by a row of holes.

357. H. *tuberculata.*—Ovate-oblong, spirally striated with irregular transverse folds.

Auris marina major, *List.* Conch. t. DCXI. f. 2.—Hal. tub. *Linn.* Syst. i. 1256. *Mont.* Test. Brit. 473.—On rocks at low water-mark at Guernsey and Jersey; rarely thrown ashore on the southern coasts of England.

Length from three to four inches, breadth from two and a quarter to three inches; strong, opake, brownish on the outside, beautifully iridescent within; apex with a single spiral turn, slightly produced; outer lip thin, inner lip thickened, inflected, and smooth. Animal with the sides ornamented with filaments, some of which pass through the holes in the shell; hood emarginate, proboscis with two corneous cheek-plates, and a narrow spinous tongue.

CREPIDULIDÆ.

Gen. LXXXVI. **CALYPTREA.**—Shell conical, with a central subspiral apex; cavity with a restricted subspiral plate.

358. C. *chinensis.*—Shell depressed, apex central, blunt, with a single whorl; unequally striated spirally.

Patella rotunda, *List.* Conch. t. DXLVI. f. 39.—P. chinensis, *Linn.* Syst. i. 1257.—P. albida, *Don.* Brit. Shells, t. 129.—P. chin. *Mont.* Test. Brit. 489. t. xiii. f. 4.—West coast of England and Dublin Bay, on oysters.

Breadth $\frac{5}{8}$ths, height $\frac{2}{8}$ths, brownish-white; widely conical; surface rough with short concave scales; inside smooth and glossy; the spiral striæ mark the direction of the growth of the shell.

EXTINCT SPECIES.

Mr Parkinson has figured a shell from the Crag of Essex (Organic Remains, iii. 52. t. v. f. 10.), which he considers as agreeing with Lister's *Patella rotunda.* "It forms a depressed cone, with a circular base and mammillary apex." Some specimens from Harwich "had their upper parts completely invested with a mineralized sponge, or alcyonic mass."

Gen. **INFUNDIBULUM.**—Shell conical, with a spiral groove marking the whorls; aperture orbicular, with a regular decurrent spiral plate occupying the cavity.

1. I. *rectum.*—Conical, concentrically striated; apex central, acute, turns of the spire obsolete; plate rectangular; pillar slender.—*Sower.* Min. Conch. t. xcvii. f. 3.—In *Crag* at Holywell.

2. I. *obliquum.*—Flattish, smooth; apex curved, adpressed, oblique; internal plate two-thirds the diameter of the mouth, and reflected near the pillar. —*Sower.* Min. Conch. t. xcvii. f. 1.—*London Clay.*

3. I. *tuberculatum.*—Gibbous, conical, oblique, rugosely tuberculated.—(Trochus apertus, *Brander*, t. i. f. 1, 2.) *Sower.* Min. Conch. t. xcvii. f. 4, 5.—*London Clay.*

4. I. *echinulatum.*—Gibbous, depressed, conical, oblique; apex acute, smooth; last turn obscurely echinulated.—*Sower.* Min. Conch. t. xcvii. f. 2.—*Plastic Clay.*

5. I. *spinulosum.*—Conical, apex acute, nearly central; whorls obscure, surface covered with numerous short hollow spines or small tubercles.—*Sower.* Min. Conch. t. xcvii. f. 6.—*London Clay.*

GEN. CREPIDULA.—Shell oblong, widely conical, with a depressed marginal spiral apex; aperture in part closed by a projecting horizontal plate.

1. C. *sinuosa.*—" Shell roundish oval, smooth, entirely milk-white; with the margin sinuate. Length half an inch; breadth four-tenths. Found at Scarborough in Yorkshire by Mr Bean. The outer surface is polished, and, under a glass appears to be very finely and irregularly striate transversely; but it has no ribs, nor prickles, nor colourings of any kind."—*Dr Turton*, Zool. Journ. No. vii. 364. t. xiii. f. 5. (The editors of the Journal add, " We cannot agree with Dr Turton in placing this Crepidula on the British list, as Mr Bean informed us that he took it from the bottom of a ship just arrived from North America.")

GEN. PILEOLUS.—Conical, a short internal spire; aperture in part closed by a projecting horizontal plate with a crenulated margin, and an opposed prominent lip.

1. P. *plicatus.*—Obtusely conical, with diverging ridges extending to the edge; margin irregularly crenated, the centre of the base divided.—*Sower.* Min. Conch. t. ccccxxxii. f. 1-4.—In *Oolite* at Ancliff and Hinton.

2. P. *lævis.*—Shell rather flat, smooth, with an entire margin.—*Sower.* Min. Conch. t. ccccxxxii. f. 5-8.—Found along with the last.

CAPULIDÆ.

GEN. LXXXVII. CAPULUS.—Shell conical, with the apex towards the margin recurved and subspiral; muscular impression semicircular; foot complicated on its anterior margin; gills in a single series across the branchial cavity.

359. C. *hungaricus.*—Shell acuminated at the spiral apex, and divergingly striated.

The Fool's-cap, *Borl.* Corn. 276. t. xxviii. f. 4.—Patella ungarica, *Linn.* Syst. i. 1259. *Penn.* Brit. Zool. iv. 143. t. xc. f. 147. *Don.* Brit.

Shells, t. xxi. f. 1. *Mont.* Brit. Shells, 486.—On rocks and shells in rather deep water.

Breadth sometimes reaching to an inch and a half; white, with a carnation tinge; cuticle brown, rough with a pilose margin; aperture round, slightly waved.

360. C. *antiquatus.*—Apex blunt, the layers of growth forming concentric scale-like wrinkles.

Patella rugosa, *List.*. Conch. t. DXLIV. f. 31.?—P. ant. *Linn.* Syst. i. 1259. *Pult.* Dorset. 51.—*Mont.* Test. Brit. 485.—On different parts of the coast, rare.

Breadth about half an inch; thick, opake, white, apex variable in form; aperture oval or round.

361. C. *militaris.*—Shell decussated by longitudinal and transverse striæ.

Patella alba, *List.* Conch. t. DXLIV. f. 32.—P. mil. *Pult.* Dorset. 51. *Don.* Brit. Shells, t. clxxi. *Mont.* Test. Brit. 488. t. xiii. f. 11.—On different parts of the coast, rare.

Breadth about half an inch; subpellucid, white; cuticle brown, pilose; apex much reflected and recurved; aperture round; inside glossy white.

EXTINCT SPECIES.

1. C. *unguis.*—Depressed, suborbicular, obscurely radiated; vertex oblique, recurved, extended beyond the base, acute.—Patella unguis, *Sower.* Min. Conch. t. cxxxix. f. 7.—In *Crag*, Holywell.

FISSURELLADÆ.

GEN. LXXXVIII. FISSURELLA.—Shell ovate, conical, with a perforated apex; tentacula with eyes at the external base.

362. F. *græca.*—Oval, decussated by unequal longitudinal ribs and transverse striæ; apex truncated.

Patella cancellata, *List.* Conch. t. DXXVII. f. 2.—P. græca, *Linn.* Syst. i. 1262 *Penn.* Brit. Zool. iv. 144. t. lxxxix. f. 153.—P. reticulata, *Don.* Brit. Shells, t. xxi. f. 3.—Western coasts, not common.

Length of the aperture about three quarters of an inch, breadth half an inch; height a quarter; thick, brown, inside white or rayed with brown; perforation of the apex oblong; margin of the aperture waved, crenulated.

363. F. *apertura.*—Conical, with a reflected subspiral apex.

Patella apertura, *Mont.* Test. Brit. 491. t. xiii. f. 10.—South of England and Zetland.

Length about ⅝ths, height ⅛th, subpellucid, white, strong, the longitudinal tubercled ribs crossed by a few circular ridges; apex adhering, the perforation in front rhomboidal; margin of the aperture oval, crenated by the ribs.

Dr Turton (Conch. Dict. 142. t. xxii. f. 81.) describes a shell as *Patella Nubecula*, List. Conch. t. dxxxix., belonging to this genus, in the following terms: "Shell oblong, oval, sometimes a little contracted in the middle, semitransparent, a little convex, white, with red or brownish rays, which are broader or narrower, sometimes interrupted, and often not extending quite to the crown, with numerous obscure longitudinal ribs, and a few irregular transverse furrows, which give it a rather rugged appearance towards the margin, crown not quite central, with an oblong perforation round which is often a purplish ring; inside white, glossy, with a purplish ring round the perforation at the bottom; the margin plain: length ⅝ths of an inch; breadth and height about ⅜ths.—These shells have been frequently brought to us, as having been dredged off the Land's End, on the Cornish coast; but it has not occurred to us, as yet, to find them ourselves.

EXTINCT SPECIES.

1. F. *græca ?*—"Ovate, oblong, convex, radiated; radii decussated by elevated lines, and thickened at the intersections; perforation small, elongated; margin of the base crenulated."—*Sower.* Min. t. cccclxxxiii.—In *Crag*, Ipswich.

2. F. *calthrata.*—An elevated curved cone; sides coarsely reticulated; longitudinal ribs about six on each side, and one central, which is split more than half way down from the apex; base oval; apex bent almost down to the base.—*Sower.* Min. Conch. t. cxix. f. 1.—*Oolite* at Ancliffe.

Gen. LXXXIX. EMARGINULA.—Conical, the anterior margin of the aperture with a longitudinal slit; tentacula on footstalks; foot fringed with filaments.

364. E. *fissura.*—Strongly cancellated by longitudinal and transverse ribs; apex reflected.

> Patella exigua, *List.* Conch. t. dxliii. f. 28.—P. fissura, *Linn.* Syst. i. 1261. *Penn.* Brit. Zool. Iv. 144. t. xc. f. 151. *Don.* Brit. Shells, t. iii. f. 2. *Mont.* Test. Brit. 490.—Various parts of the coast, not common.

Length half an inch, breadth and height ⅜ths; subpellucid, brown when alive, white or flesh-coloured when worn; longitudinal-ribs strong; vertex more or less reflected, margin oval, crenated; the branchial slit extending about one-fourth of the height of the shell; inside glossy flesh-coloured.—Mr Bell describes a shell apparently belonging to this species, in the Zool. Journ. i. 52. t. iv. f. 1., as having been found at Poole Harbour, under the title *E. rosea*. It only differs from *E. fissura* in the variable characters of the apex being higher and more recurved, and the inside of a delicate rose-colour.

EXTINCT SPECIES.

1. E. *crassa.*—Oval, obtusely conical, furrowed; with four or five striæ between each furrow; fissure wide.—*Sower.* Min. Conch. t. xxxii., upper figures.—In *Crag*, Ipswich.

2. E. *reticulata.*—Shell oval, reticulato-striated, vertex rather acute; principal radii twenty-four or more.—*Sower.* Min. Conch. t. xxxiii., lower figures.—In *Crag?* Holywell.

3. E. *tricarinata.*—Conical, with the apex bent down; surface marked with three principal, and several lesser ribs, the spaces between them nearly smooth; base oblong.—*Sower.* Min. Conch. t. DXIX. f. 2.—In *Oolite* at Ancliff.

4. E. *scalaris.*—Conical, ribbed; apex excentric; ribs many, connected by numerous cross lines; base obovate.—*Sower.* Min. Conch. t. DXIX. f. 3.—In *Oolite* at Ancliffe.

GEN. XC. SCISSURELLA.—Shell with a depressed spire; the outer-lip notched with a deep slit, following the growth of the volutions, obliterated to within a short distance of the margin, and forming a sort of keel upon the back of the shell.

365. S. *crispata.*—Transversely ribbed, and spirally striated; inner-lip reflected on the body-whorl.

In shell-sand at Noss, Zetland, after a storm.

Breadth about the fifteenth of an inch; white, and without any apparent cuticle: whorls three, increasing rather rapidly from the slightly elevated apex, and sloping, with a gentle convexity, from the separating line to the keel; under side with a central cavity, from which the whorl extends, a little convex, to the keel. The whorls are marked by numerous fine transverse arcuated ribs, narrower than the intervening spaces, crossed by fine longitudinal striæ (most conspicuous in the spaces), giving to the shell its peculiar reticulated appearance; the ribs on the upper side are coarser than those below. The aperture is suborbicular, slightly depressed, the outer-lip thin; the inner-lip slightly reflected over the cavity, spread on the body-whorl, and continuous with the outer-lip. From the pillar-cavity a shallow gutter extends anteally, and joins the pillar-lip; this is chiefly conspicuous on the largest specimens. The longitudinal slit in the middle of the outer-lip extends backwards about two-thirds of the diameter of the shell, where it joins the narrow groove in the keel of the shell which it had formerly occupied. The margin of the slit is slightly elevated, as well as the groove, which is seen winding round the whorls at the separating line, nearly to the apex; the groove itself is slightly ribbed across.—I found this shell in 1809, and specimens then transmitted to Mr Montagu, were pronounced by him the fry of a Trochus. It is, however, a well marked shell, and belongs to the genus *Scissurella* of M. D'Orbigny.

1

ORDER II. MOLLUSCA. ACEPHALA.

SECTION I. BRACHIOPODA.

Shell with two valves; lobes of the cloak free anteriorly; arms issuing from between the lobes at the margin of the mouth; all the species are marine and permanently attached.

PEDUNCULATA.

a. Shell supported on a fleshy peduncle.
Lingula.

b. Peduncle passing through the apex of one valve.
Terebratula.
Spirifer.
Magas.

SESSELIA.
Discina.
Criopus.

Obscure genera, apparently free, and extinct.
Pentamerus.
Productus.

PEDUNCULATA.

GEN. LINGULA.—Valves equal, oval, flat, without teeth or elastic ligament; peduncle cylindrical and cartilaginous; margin of the cloak fringed with fine hairs.

1. L. *mytilloides.*—Ovate, anterior end slightly truncated; beak indistinct. —Mussel, *Ure*, Ruth. 310. tab. xvi. 6.—*Sower.* Min. Conch. t. xix. f. 1, 2.—*Carboniferous Limestone.*—Casts of a shell imbedded in shale in the coal formation, figured by Ure, Hist. Ruth, 310. t. xvi. f. 5., probably belong to a species of this genus. They seem to have a mesial ridge, with diverging striæ.

2. L. *tenuis.*—Elongated, lanceolate, anterior end truncated.—*Sower.* Min. Conch. t. xix. f. 3.—*London Clay.*

3. L. *ovalis.*—Depressed, oblong-oval, anterior edge circular, beak very short.—*Sower.* Min. Conch. t. xix. f. 4.—*London Clay?*

GEN. XCI. TEREBRATULA.—Inequivalve, apex of the largest valve perforated or emarginated for the passage of the circular ligament; hinge consisting of a projection on each side the apex, and two elongated processes for supporting the arms on the smaller valve, projecting into the cavity.

366.—T. *cranium.*—Shell ventricose, semitransparent, front margin slightly truncated; surface finely shaggreened, and slightly wrinkled concentrically.

Mull. Prod. 249. No. 3006.—Zool. Dan. t. xciv. f. 1.—T. vitrea, *Flem.* Edin. Encyc. vol. vii. 96. t. 206. f. 2.—T. cranium, *Mont.* Linn. Trans. xi. 188. t. xiii. f. 2.—Occasionally brought from deep water by the cod-fishing-lines, Zetland.

Length an inch and $\frac{1}{10}$th, breadth $\frac{2}{10}$ths less; brownish-white; the shaggreening is remarkably delicate, and seen only by the help of a lens; the lateral teeth of the large valves are bifid; those in the small valve give origin to the two projecting processes, which have a small tooth near their base, and project horizontally, upwards of three-fourths across the shell; the concentric wrinkles of growth occur irregularly; peduncle simple.—To this probably belongs the *Anomia Terebratula* of Turton's Conchological Dictionary, p. 5., where a reference is made to Da Costa's Elements, 292. t. vi. f. 3., and where it is stated that a single specimen was dredged up alive in Dublin Bay, and placed in the Museum of the Dublin Society.

367. T. *psittacea.*—Shell oval, with regular fine longitudinal striæ; the beak much produced and curved; the margin waved.

List. Conch. t. ccii. f. 46. *Turt.* Conch. Dict. 5. t. xi. f. 42. Biv. Brit. 236.—Cast ashore, after a severe gale, at Teignmouth, where Dr Turton has since seen several fragments.

Length nearly an inch and a quarter; breadth one inch, convex, of a blackish horn-colour; sides abruptly turned in, and flattened, and marked with a few irregular striæ; front margin a little indented on each side, and projecting in the middle; perforation somewhat triangular.

368. T. *aurita.*—Regularly ribbed; the large valve broadest in the middle, semicircular in front, and becoming narrow at the apex.

Flem. Phil. Zool. ii. 498. t. iv. f. 5.—T. costata, *Lowe*, Zool. Journ. ii. 105. t. v. f. 8, 9.—West coast of Scotland.

Length about $\frac{3}{10}$ths, breadth $\frac{2}{10}$ths of an inch; whitish; the ribs, from the beak to the margin, the most distinct, rounded, and about eight in number, obsoletely wrinkled concentrically; the ribs, towards the sides, indistinct; margin crenulated by the ribs; the small valve nearly orbicular; the hinge margin subtruncated, or rather obtusely angular, and having the sides depressed; inner surface punctated; peduncle short, of numerous unequal and tubular threads attached to a complicated tendino-muscular apparatus, and chiefly to the lower valve. I obtained a small specimen of this species at Ullapool, in Loch Broom. The one, of a larger size, described by Mr Lowe, was found by Mr J. Berkely, at Oban.

EXTINCT SPECIES.

* *Margin of the valves entire, or slightlg waved.*

1. T. *subrotunda.*—Circular, depressed, smooth; valves regularly and equally convex.—*Sower.* Min. Conch. t. xv. f. 1, 2.—In *Chalk.*

2. T. *ovata.*—Ovate or oblong-ovate, depressed, smooth; small valve flattish, slightly pentangular.—*Sower.* Min. Conch. t. xv. f. 3.—In *Green Sand.*

3. T. *punctata.*—Oblong, depressed; valves equally convex; edge straightened at the front; the whole surface finely punctated.—*Sower.* Min. Conch. t. xv. f. 4.—In *Lias.*

4. T. *carnea.*—Depressed, smooth, obtusely five-sided; front edge short; valves equally convex, slightly flattened along the middle.—*Sower.* Min. Conch. t. xv. f. 5, 6.—In *Chalk.*

5. T. *subundata.*—Nearly circular, depressed, smooth; valves equally gibbous; front margin straight or slightly depressed in the middle, with one undulation on each side of it.—*Sower.* Min. Conch. t. xv. f. 7.—In *Chalk.*

6. T. *intermedia.*—Obscurely five-sided, rather depressed, smooth; larger valve most convex; front margin undulated; three depressions in the smaller valve, and two in the larger.—*Sower.* Min. Conch. t. xv. f. 8.—*Green Sand.*

7. T. *semiglobosa.*—Nearly circular, gibbous, smooth; largest valve deepest, and uniformly gibbous; front margin undulated, with two risings in the smaller valve.—*Sower.* Min. Conch. t. xv. f. 9.—In *Chalk.*

8. T. *biplicata.*—Oblong, gibbous; beak prominent; sides rounded; front straightish when full grown, elevated with two distant large plaits.—*Sower.* Min. Conch. t. xc. and t. ccccxxxvii. f. 2, 3.—In *Green Sand.*

9. T. *digona.*—Triangular, oblong, gibbous; beak prominent; sides rounded; front either convex or concave; when old, bounded by two prominent angles, alike in each valve.—*Sower.* Min. Conch. t. xcvi.—*Oolite.*

10. T. *ovoides.*—Ovate, elongated; beak prominent; larger valve gibbous,

subcarinated; lesser valve convex.—*Sower.* Min. Conch. t. c.; upper figure.—In *Green Sand.*

11. T. *lata.*—Orbicular, depressed; beak prominent; larger valve subcarinated at the back.—*Sower.* Min. Conch. t. xc.; lower figure.—In *Green Sand.*

12. T. *ornithocephala.*—Ovato-rhomboidal; depressed when young; elongated and gibbous when old; front straight, bounded by two obtuse lateral depressions, similar in each valve.—*Sower.* Min. Conch. t. ci. f. 1, 2, 4.—In *Lias.*

13. T. *lampas.*—Ovato-rhomboidal gibbous; front straight, produced, lesser valve depressed.—*Sower.* Min. Conch. t. ci. f. 3.—In *Lias*, at Lyme.

14. T. *obovata.*—Obovate, transverse, gibbous, flattish; beak prominent; front straightish, bounded by two obsolete plaits.—*Sower.* Min. Conch. t. ci. f. 5.—In *Lias.*

15. T. *retorquata.*—Oblong, ovate, front depressed by a large rounded plait; sides elevated, rounded; lower valve obtusely carinated, with a sharp beak, and a longitudinal ridge along each side.—T. resupinata, *Sower.* Min. Conch. t. cl. f. 3, 4.—*Inferior Oolite.*

16. T. *coarctata.*—Subheptagonal, gibbose, hispid, and decussated; lesser valve convex, subtrilobated; larger valve biplicated, with a deep angular sulcus between the plaits.—*Park.* Org. Rem. iii. 229. t. xvi. f. 5. *Sower.* Min. Conch. 312. f. 1, 4.—*Oolite.*

17. *reticulata.*—Obovate, gibbose, subhispid, decussated; front obscurely three-sided; lesser valve convex; larger valve obtusely biplicated, with a shallow channel between the ridges.—*Sower.* Min. Conch. t. cccxii.—*Oolite.*

18. T. *acuminata.*—Heart-shaped; front much elevated, with a deep acute angular sinus in the margin; surface finely striated.—*Mart.* Derb. t. xxxii, xxxiii. f. 5, 8. *Sower.* Min. Conch. t. cccxxiv. and t. ccccxcv.—In *Carboniferous Limestone.*

19. T. *affinis.*—Orbicular, strongly striated; upper valve gibbose, with an elevated sinus in the front; lower valve nearly flat.—*Sower.* Min. Conch. t. cccxxiv. f. 2.—In *Carboniferous Limestone.*

20. T. *resupinata.*—Transversely ovate, longitudinally striated; striæ minute, numerous, and equal; imperforate valve most convex; perforation triangular.—*Mart.* Derb. t. xlix. f. 13, 14.—*Sower.* Min. Conch. t. cccxxv.—In *Carboniferous Limestone.*

21. T. *lineata.*—Transversely oval, gibbose; minutely striated longitudinally, and transversely sulcated; sulci distant, *Mart.* Derb. xxxvi. f. 3.—*Sower.* Min. Conch. t. cccxxxv. f. 1, 2.—*Carboniferous Limestone.*

22. T. *imbricata.*—Transversely oval, gibbose, imbricated, longitudinally sulcated; front slightly elevated; sulci obsolete.—*Sower.* Min. Conch. t. ccccxxxv. f. 3, 4.—In *Carboniferous Limestone.*

23. T. *elongata.*—Oval, convex, smooth; margin even; beak incurved.—*Sower.* Min. Conch. t. ccccxxxiv. f. 1, 2.—In *Chalk.*

24. T. *sphæroidalis.*—A depressed spheroid, with a slightly produced beak.—*Sower.* Min. Conch. t. ccccxxxv. f. 3.—*Oolite.*

25. T. *bullata.*—Orbicular, ventricose, with a produced and recurved beak; front indented; depth greater than width.—*Sower.* Min. Conch. t. ccccxxxv. f. 4.—*Upper Oolite.*

26. T. *emarginata.*—Subrhomboidal; the lesser valve nearly flat, the other

convex; front defined by two angles, or emarginate; edge becoming blunt by age.—*Sower.* Min. Conch. t. ccccxxxv. f. 5.—*Upper Oolite.*

27. T. *globata.*—Subglobose; front elevated with two obtuse folds, and slightly produced; surface often minutely punctated.—*Sower.* Min. Conch. t. ccccxxxvi. f. 1.—*Upper Oolite.*

28. T. *perovalis.*—Ovate, convex, with two elevated sinuses at the front, which is depressed between them; beak incurved.—*Sower.* Min. Conch. t. ccccxxxvi. f. 2, 3.—*Under Oolite.*

29. T. *maxillata.*—Subquadrangular, convex; two acute rising sinuses in the front, and one obtuse sinus on each side; three conspicuous furrows in the upper, and two in the lower valve; front rounded.—*Sower.* Min. Conch. t. ccccxxxvi. f. 4.—*Upper Oolite.*

30. T. *Sella.*—Subquadrangular, convex; front considerably elevated, narrow, emarginated when old; sides depressed, slightly rounded.—*Sower.* Min. Conch. t. ccccxxxvii. f. 1.—*Upper Oolite.*

31. T. *obtusa.*—Suborbicular, rather depressed; front broad, elevated; edge obtuse.—*Sower.* Min. Conch. t. ccccxxxvii. f. 4.—From *Cambridge.*

32. T. *obesa.*—Ovate, gibbose, front elevated considerably, with a slight broad sinus in the middle; beaked valve regularly convex to the edge; beak incurved, short.—*Sower.* Min. Conch. t. ccccxxxviii. f. 1.—In *Chalk.*

33. T. *bucculenta.*—Rather square, with rounded sides, convex; front produced, truncated, very slightly elevated; beak short.—*Sower.* Min. Conch. t. ccccxxxviii. f. 2.—In *Green Sand.*

34. T. *triquetra.*—Suborbicular, with a produced incurved beak; valves equally convex; front slightly indented; beak obtusely keel-shaped, with a carina on each side.—*Sower.* Min. Conch. t. ccccxlv. f. 1.—In *Oolite.*

35. T. *indentata.*—Elliptical, smooth, more or less gibbose; valves equally convex; front deeply notched; beak small, much incurved.—*Sower.* Min. Conch. t. ccccxlv. f. 2.—In *Limestone at Banbury.*

36. T. *Sacculus.*—Obovate, gibbose, with a longitudinal groove along the larger valve; the smaller valve slightly grooved; front emarginate.—Anomia lævis, *Ure's* Ruth. 313. t. xvi. f. 9.—A sacculus, *Martin's* Derb. t. xlvi. f. 1, 2. —Ter. Sacc. *Sower.* Min. Conch. t. ccccxlvi. f. 1.—In *Carboniferous Limestone.*

37. T. *hastata.*—Elliptical, subrhomboidal, rather depressed; front truncated and indented; edges sharp.—*Sower.* Min. Conch. t. ccccxlvi. f. 2, 3.—*Greywacke Limestone, Cork.*

38. T. *cornuta.*—Short, convex, with blunt edges, four-lobed; the two middle lobes produced; the others very short.—*Sower.* Min. Conch. ccccxlvi. f. 4.—In *Oolite.*

39. T. *ambigua.*—Subpentangular, gibbose, perforated valve with a broad mesial groove, with a mesial ridge, having a shallow central furrow enlarging at the margin.—Spirifer ambiguus, *Sower.* Min. Conch. t. 376.—*Carboniferous Limestone.*

** *Margin of the valves dovetailed.*

40. T. *lateralis.*—Oval, broader than long, gibbous; middle of the front much elevated, with three deep but short plaits; sides with two plaits each, much below the middle.—*Sower.* Min. Conch. t. lxxxiii. f. 1.—In *Carboniferous Limestone.*

41. T. *crumena.*—Deltoid, gibbous, plaited; middle of the front elevated,

with three long plaits; sides with four or more plaits below the middle; beak prominent.—Anomia striata, *Ure*, Ruth. 313. t. xiv. f. 6.—Ammonites crumena, *Mart.* Derb. t. xxxvi. f. 4.—Ter. erum. *Sower.* Min. Conch. t. lxxxiii. f. 2, 3.—*Carboniferous Limestone.*

42. T. *tetraedra.*—Obtusely deltoid, gibbous, plaited; front elevated in the middle, with four or five sharp plaits; four or more sharp plaits on each side; beak rather incurved.—*Sower.* Min. Conch. t. lxxxiii. f. 4.—In *Oolite.*

43. T. *media.*—Very obtusely deltoid; gibbous, plaited; front rounded, with a rising in the middle, composed of six sharp plaits approaching those in the middle; beak a little incurved.—*Sower.* Min. Conch. t. lxxxiii. f. 5.—In *Oolite.*

44. T. *concinna.*—Nearly globose; acutely plaited; middle elevated by seven plaits; twelve or more plaits on each side; beak projecting.—*Sower.* Min. Conch. t. lxxxiii. f. 6.—In *Oolite.*

45. T. *obsoleta.*—Nearly round, gibbous, plaited; middle of the front a little elevated by seven plaits; sides having from seven to eleven plaits; beak projecting.—*Sower.* Min. Conch. t. lxxxiii. f. 7. In *Oolite.*

46. T. *plicatilis.* Gibbose, transversely obovate, finely and obtusely plaited; middle elevated by twelve plaits; fifteen or more plaits on each side; beak slightly projecting. *Sower.* Min. Conch. t. cxviii. f. 1. In *Chalk.*

47. T. *octoplicata.* Gibbose, transversely obovate, obtusely plaited; middle elevated by eight plaits; twelve or fourteen plaits on each side; beak projecting. *Sower.* Min. Conch. cxviii. f. 2. In *Chalk.*

48. T. *Wilsoni.*—Circular, plaited; front cylindrical, margin acutely dentated, elevated in the middle with seven plates, nine or ten plates on each side; valves compressed towards the beaks.—*Sower.* Min. Conch. t. cxviii. f. 3.—In *Carboniferous Limestone* at Mordiford, E.S.E. of Hereford.

49. T. *pectita.*—Orbicular, gibbose, plicato-striated, with a flattish space extending from the front to the beaks; beak of the lower valve prominent, slightly incurved, back of the upper valve straight, with an incurved beak.—*Sower.* Min. Conch. t. cxxxviii. f. 1.—In *Green Sand.*

50. T. *Lyra.*—Oblong, convex, with diverging furcated plaits; beak of the lower valve greatly elongated, with two longitudinal septa, that of the upper valve short, incurved.—*Sower.* Min. Conch. t. cxxxviii. f. 2.—In *Green Sand.*

51. T. *acuta.*—Ovato-triangular, slightly transverse; middle elevated by one large acute angular plait; sides with one large and several small, plaits each.—*Sower.* Min. Conch. t. cxl. f. 1, 2.—*Inferior Oolite.*

52. T. *Mantiæ.*—Depressed, subtrigonous; with 16 angular plaits, half of them on one side elevated; upper valve convex.—*Sower.* Min. Conch. t. cclxvii. f. 1.—*Carboniferous Limestone*, Ireland.

53. T. *obliqua.*—Depressed, transversely obovate, with 15 angular plaits, the 5 central ones obliquely elevated from one side; beak prominent.—*Sower.* Min. Conch. t. cclxxvii. f. 2.—In *Chalk.*

54. T. *inconstans.*—Globose, with about 26 angular plaits, half of them, on one side, elevated; beak incurved.—*Sower.* Min. Conch. t. cclxxvii. f. 3, 4.—*Middle Oolite.*

55. T. *dimidiata.*—Transversely obovate, subdepressed, with a projecting beak, plaited; upper valve convex; plaits about 30, half of which, on one side, are elevated.—*Sower.* Min. Conch. t. cclxxvii. f. 5.—In *Green Sand.*

56. T. *Fimbria.*—Orbicular, globose; margin undulato-plicated. — *Sower.* Min. Conch. t. cccxxvi.—*Under Oolite.*

57. T. *cordiformis.*—Heart-shaped, front much elevated, with a deep sinus in the margin; sides rather convex, sharp-edged; middle ornamented with several acute furrows, reaching almost to the beaks.—*Sower.* Min. Conch. t. ccccxcv. f 2, 4.—*Carboniferous Limestone,* Ireland.

58. T. *reniformis.*—Reniform, middle furnished with 3 or 4 longitudinal ridges, terminated by acute plaits in the much elevated margin of the front; sides inflated below the entire edges.—*Sower.* Min. Conch. t. ccccxcvi. f. 1–4. —*Carboniferous Limestone,* Ireland.

59. T. *platyloba.*—Transversely obovate, depressed; front elevated, with several acute plaits in the middle of the sinus; sides with one or two obscure plaits upon their edges.—*Sower.* Min. Conch. t. ccccxcvi. f. 5, 6.—In *Carboniferous Limestone* at Clitheroe.

60. T. *Pugnus.*—Obovato-deltoid, rather depressed; front much elevated, with from 4 to 6 plaits in the middle of the sinus; sides convex, with several plaits upon their edges.—Anomites Pugnus, *Mart.* Derb. t. xxiii. f. 4, 5.—T. Pug. *Sower.* Min. Conch. t. ccccxcvii.—In *Carboniferous Limestone.*

61. T. *lata.*—Transversely oblong, convex, regularly plaited; front elevated; the perforated valve flattest, with a produced beak; plaits 40.—*Sower.* Min. Conch. t. Dii. f. 1.—In *Green Sand.*

62. T. *depressa.*—Triangular, depressed, regularly plaited; front elevated; lateral angles rounded; beaks produced; plaits 20.—*Sower.* Min. Conch. t. Dii. f. 2.—In *Green Sand.*

63. T. *nuciformis.*—Transversely oblong, globose, regularly pliated; front elevated; beak produced; plaits 30, rounded.—*Sower.* Min. Conch. t. Dii. f. 3.—In *Green Sand.*

64. T. *acuta.*—Transversely oblong, gibbose, largely plaited; front elevated with six plaits, of which the lateral are the largest; beak slightly produced; plaits 20, sharp.—*Sower.* Min. Conch. t. Dii. f. 4.—In *Lias,* Clieve Hill, near Cheltenham.

65. T. *plicatella.*—Subglobose, rather square, plaited; front elevated; beak small, with a broad oblong concave space on each side; plaits 40, rounded.—*Sower.* Min. Conch. t. Diii. f. 1.—In *Inferior Oolite.*

66. T. *serrata.*—Rounded triangular, convex, with a blunt margin, largely plaited; beak small, with a large, nearly flat, space on each side of it; plaits sharp, about 11, of which, 5 are a little raised in front.—*Sower.* Min. Conch. t. Diii. f. 2.—In *Lias.*

67. T. *flabellula.*—Depressed, plaited; plaits about 16, simple, rounded; lesser valve transversely obovate; larger valve with a straight, rectangular, projecting beak.—*Sower.* Min. Conch. t. Dxxxv. f. 1.—In *Oolite.*

68. T. *furcata.*—Nearly orbicular, plaited; plaits rounded, about 9 in number, forked when full grown; the larger valve most convex; its beak large, curved.—*Sower.* Min. Conch. t. Dxxxv. f. 2.—In *Oolite.*

69. T. *orbicularis.* — Uniformly convex, plaited; plaits angular, simple, about 15; lesser valve orbicular, the other with a large curved beak.—*Sower.* Min. Conch. t. Dxxxv. f. 3.—In *Lias.*

70. T. *oblonga.*—Oblong, gibbose, plaited; plaits 16 or more, forked, their edges rounded; beaks large, broad, slightly incurved.—*Sower.* Min. Conch. t. Dxxxv. f. 4, 5, 6.—In *Green Sand.*

71. T. *hemisphærica.*—Hemisphærical, with a produced incurved beak, longitudinally striated; striæ very numerous.—*Sower.* Min. Conch. t. cccxxxvi. f. 1.—In *Oolite.*

72. T. *rigida.*—Orbicular, plaited; plaits granulated, increasing in number towards the margin; lesser valve nearly flat, the other convex, with a small beak.—*Sower.* Min. Conch. t. DXXXVI. f. 2.—In *Chalk.*

73. T. *striatula.*—Imperfectly bilobate, compressed, longitudinally ovate and striated; front truncated, sometimes with a sinus; striæ granulated, repeatedly forked.—*Mant.* Geol. Suss. 131. t. xxv. f. 7, 8, and 12. *Sower.* Min. Conch. t. DXXXVI. f. 3, 4, 5.—In *Chalk.*

74. T. *pisum.*—Suborbicular, rather square, thick, depressed, plaited; plaits numerous, simple, sometimes granulated; front slightly elevated, beak small, incurved.—*Sower.* Min. Conch. t. DXXXVI. f. 6, 7.—In *Chalk Marl.*

75. T. *rostrata.*—Suborbicular, gibbose, plaited; plaits many, rounded; beak large, produced, slightly incurved, pointed; front slightly elevated.—*Sower.* Min. Conch. t. DXXXVII. f. 1, 2.—In *Chalk Marl.*

76. T. *truncata.*—Semicircular, plaited; plaits sharp, from 9 to 20, some of them forked; front elevated with from 1 to 5 plaits; hinge-line straight, equal to the width of the shell; lesser valve nearly flat, the other subconical, with a straight beak, which is flat in the front.—*Sower.* Min. Conch. t. DXXXVII.—In *Green Sand.*

77. T. *Gibbsiana.*—Suborbicular, rather triangular, ventricose, with numerous rounded, simple plaits; front much elevated, with about 10 or 12 plaits, flattened; beak small, incurved, pointed; small valve most convex.—*Sower.* Min. Conch. t. DXXXVII. f. 4.—In *Green Sand.*

78. *Mantelliana.*—Transversely obovate, gibbose, plaited; plaits 10, sharp, front elevated with 4 to 6 plaits; beak prominent but small.—*Sower.* Min. Conch. t. DXXXVII. f. 6.—In *Chalk Marl.*

Besides the above extended list of extinct species (of which not a few will probably be found to be varieties), there are indications of a few other species in the writings of British geologists; but too obscure to warrant their insertion here.

GEN. SPIRIFER.—Hinge transverse; perforation for the ligament triangular, in a longitudinal flattened space under the beak; two spirally coiled linear appendages to the hinge, nearly filling the shell.

1. S. *cuspidatus.*—Apex of the perforated valve broadly truncated, forming a flat triangular space, the base of which is in the hinge, longitudinally ribbed with a broad mesial furrow; the other valve ribbed, with a mesial ridge. —Anomia cusp. *Mart.* Linn. Trans. iv. 45. t. iii.—Spir. cusp. *Sower.* Min. Conch. t. cxx and t. cccclxi. f. 2.—In *Carboniferous Limestone.*

2. S. *trigonalis.*—Gibbose, transversely striated, with about twenty-six radiating sulci; hinge-line as long as the shell is wide; front semicircular; the three central ridges elevated; beaks incurved, approximating.—Anomiæ striata, *Ure,* Ruth. 314. t. xv. f. 1.—An. trigonalis, *Mart.* Derb. t. xxxvi. f. 1.—Spir. trig. *Sower.* Min. Conch. t. cclxv.—In *Carboniferous Limestone.*

3. S. *triangularis.*—“ Differs from *S. trigonalis* principally in the sides being direct or straight, not rounded, forming acute angles with the hinge; and,

in the sinus, which is smooth and angular, instead of being rounded and striated."—*Mart.* Derb. t. xxxvi. f. 2.—In *Carboniferous Limestone*, Derbyshire.

4. S. *oblatus.*—Gibbose, transversely obovate, smooth, with an obtuse, rather square, elevation along the middle; beaks approximated.—*Sower.* Min. Conch. t. cclxviii.—*Carboniferous Limestone.*

5. S. *glaber.*—Nearly twice as wide as long, generally sharp-edged.—*Mart.* Derb. t. xlviii. f. 9-10.—*Sower.* Min. Conch. cclxix., two upper fig.—In *Carboniferous Limestone:*—probably identical with the last.

6. S. *obtusus.*—Gibbose, transversely oval, very obscurely striated, with an obtuse, rounded elevation along the middle; beaks rather distant.—*Sower.* Min. Conch. t. cclxix., two lower figures.—In *Carboniferous Limestone.*

7. S. *striatus.*—Hinge-depression extending the whole breadth of the shell; longitudinal ribs numerous, unequal, branched, mesial ridge rounded.—Anomites striatis. *Mart.* Derb. t. xxiii. — Spir. striatus, *Sower.* Min. Conch. t. cclxx., and S. rotundatus, ib. t. cccclxi. f. 1.—*Carboniferous Limestone.*

8. S. *pinguis.*—Gibbose, transversely obovate, with a straight back, longitudinally sulcated, elevated in the middle; sulci eight or nine on each side, and one in the centre of the elevation.—*Sower.* Min. Conch. t. cclxxi.—*Carboniferous Limestone.*

9. S. *acutus.*—Valves convex, semicircular, with deep equal ribs, the mesial edge and furrow smooth; hinge-space short; beak of the perforated valve prominent, incurved.—Anomites acutus, *Mart.* Pet. Derb. t. xlix. f. 15, 16. Spirifer minimus, *Sower.* Min. Conch. t. ccclxxvii. f. 1.—*Carboniferous Limestone.*

10. S. *Walcottii.*—Suborbicular, gibbose, with one large, rounded, elevated fold in the middle, and four smaller ones on each side.—*Sower.* Min. Conch. t. ccclxxvii. f. 2. In *Lias.*

11. S. *lineatus.*—Gibbose, covered with numerous diverging sharp striæ; front semicircular, elevated in the middle; from the elevation of the front a convex band proceeds to the beak; hinge-line long and straight; beaks rather distant.—*Sower.* Min. Conch. t. ccccxcii. f. 1, 2.—In *Carboniferous Limestone.*

12. S. *attenuatus:*—Convex, covered with numerous linear furrows, which increase in number towards the margin; front rounded, elevated in the middle, from each side of the elevation a deep furrow proceeds to the beak; sides produced, pointed; hinge-line long, straight; space between the beaks flat, with nearly parallel edges.—*Sower.* Min. Conch. t. ccccxciii. f. 3, 4, 5.—In *Carboniferous Limestone.*

13. S. *bisulcatus.*—Semicircular, gibbose, longitudinally sulcated, elevated in the middle, a deep furrow on each side the elevation; hinge-line long, straight; beaks close.—*Sower.* Min. Conch. t. ccccxciv.—*Carboniferous Limestone.*

14. S. *distans.*—Semicircular, gibbose; sides sulcated longitudinally; front elevated, elevation extending to the beaks, concave along the middle; beaks incurved, distant, the space between them curved, triangular.—*Sower.* Min. Conch. t. ccccxciv. f. 3.—*Carboniferous Limestone.*

15. S. *resupinatus.*—Transversely oval, with numerous longitudinal striæ and distant marks of growth; perforated valve slightly convex towards the beaks, depressed towards the margin; the other valve more convex; mar-

gin not waved; hinge patulous, short.—Anomiæ striata, *Ure*, Ruth. 314. t. xiv. f. 13, 14.—A. resupinatus, *Mart.* Derb. t. xlix. f. 13, 14.—In *Carboniferous Limestone.*

16. S. *Martini.*—Transversely oval, convex, decussatedly striated; the longitudinal striæ close, equal, minute; the transverse ones broad, prominent, remote; beak incurved, pointed; hinge patulous, short.—Anomitis lineatis, *Mart.* Derb. t. xxxvi. f. 3.—In *Carboniferous Limestone.*

17. S. *Urii.*—Smooth, a mesial furrow in each valve, ending in front in a straight wave of the margin; imperforate valve nearly flat, with a straight gibbosity at the apex; perforated valve with a gibbous lengthened incurved beak; hinge patulous, short.—*Ure*, Ruth. 313. t. xiv. f. 12.—*Carboniferous Limestone.*

18. S. *exaratus.*—Perforated valve with broad, smooth, flattened ribs, divided by shallow narrow furrows; beak gibbous, incurved, hinge very short. I have frequently found the perforated valve of this well marked species, but always mutilated, and without the other valve.—In *Carboniferous Limestone*, West Lothian.

Gen. MAGAS.—" An unequilateral unequivalved bivalve; one valve with an angular sinus along an incurved beak; line of the hinge and back of the other valve straight, with two projections near the middle. A partial longitudinal septum, with appendages attached to the hinge within."—*(Sowerby.)*

1. M. *pumilus.*—The beaked valve is hemispherical, smooth, with a circular edge, and small, incurved beak; the other valve nearly flat, with a long transverse straight beak.—*Sower.* Min. Conch. t. cxix.—In *Chalk.*

SESSILIA.

Gen. XCII. DISCINA.—Shell convex, upper valve with an entire subcentral apex, under valve with the apex prominent and pierced by an oblong fissure, for the passage of the ligament.

369. D. *ostreoides.*—Upper valve with fine longitudinal ribs, crossed by concentric wrinkles.

Lamark, Hist. pt. i. 236.—Orbicula Norvegica, *G. B. Sowerby*, Lin. Trans. xiii. 468. t. xxvi. f. 2.—Habitat uncertain.

Length about $\frac{5}{10}$ths, breadth $\frac{4}{10}$ths of an inch; brown, the lower valve white; the margin is more or less waved; the ribs, as they proceed from the apex, are slightly bent, the concentric wrinkles of growth are numerous and unequal, especially near the margin; inside, under the apex, with two irregular callous ridges; under valve concentrically wrinkled, a disc round the fissure, to which the peduncle adheres; inside thickened round the fissure, with a vertical grooved tooth. I have been induced to give this species (which was found attached to stones used as ballast, and brought to Lambeth) its present place, but even without good proof of its British origin, for the purpose of rectifying some strange mistakes in nomenclature, which have been committed in reference to this and the following genus. The specimen in my possession I owe to the kindness of Mr J. Sowerby.

EXTINCT SPECIES.

1. D. *reflexa.*—Shell subelliptical, most pointed towards the back, polished; upper valve rather convex, with the vertex near the posterior margin; lower valve flat, with a nearly central vertex, the margin reflected; sinus for the byssus large, elongated.—Orbicula ref. *G. B. Sower.* Zool. Journ. ii. 321. t. xi. f. 7. Min. Conch. t. dvi. f. 1.—*Lias.*

2. D. *Humphreisiana.*—Conical, orbicular, marked with diverging striæ; apex elevated, rather excentric, obtuse.—Orbicula Humph. *Sower.* Min. Conch. t. dvi. f. 2.—*Oolite.*

3. D. *granulata.*—Conical, orbicular, marked with granulated radii; apex elevated.—Orbicula gran. *Sower.* Min. Conch. t. dvi. f. 3, 4.—*Oolite* at Ancliffe.

GEN. XCIII. **CRIOPUS.** (POLI.)—Under valve cemented to stones; upper valve depressed, the inside with two rounded marginal, and two arculated subcentral muscular impressions.

370. C. *anomalus.*—Shell rough, with obsolete concentric wrinkles, apex prominent.

Patella anomala, *Mull.* Prod. 237. No. 2870. Zool. Dan. t. v. f. 1–8.—Patella distorta, *Flem.* Edin. Ency. vii. 65. t. 204. f. 4.—*Mont.* Linn. Trans. xi. 195. t. xiii. f. 5.—Orbicula Novegica, *Lam.* Hist. vi. pt. i. 242.—Crania personata, *G. B. Sowerby,* Linn. Trans. xiii. 471. t. 26. f. 3.—Criopus anomalus, *Flem.* Phil. Zool. ii. 499.—Discina ostreoides, *Turt.* Biv. Brit. 238.—On loose stones from deep water, Zetland.

Length $\frac{5}{10}$ths, breadth $\frac{4}{10}$ths, and height $\frac{2}{10}$ths of an inch; brown; subquadrangular, wrinkled by the lines of growth, apex subcentral, inside punctated; lower valve very thin, in young specimens membranaceous; four muscular impressions. Muller states, that the spiral arms are white. According to Mr G. B. Sowerby the *C. turbinatus*, the type of the genus *Criopus* of *Poli*, and *Orbicula*, of Lamark, from the Mediterranean, differ only in the greater thickness and irregularity of the lower valve. A specimen referred to the Mediterranean species has been found by Mr Miller, at Bristol, on the Arca Noæ. It is probable that the genus *Crania* of Lamark is nearly related to, yet distinct from, the *Criopus.*

EXTINCT SPECIES.

1. C. *Parisiensis.*—Suborbicular, depressed; upper valve thin, obscurely granulato-spinose, smooth in the centre; lower valve thick, with the margin much elevated, and of a conspicuously cellular structure.—Crania Par. *Sower.* Min. Conch. t. 408.—On Echini in *Chalk.*

GEN. PENTAMERUS.—Shell bivalve, equilateral, inequivalved; one valve divided by a longitudinal internal septum into two parts, the other by two septa into three parts or valves. Beaks incurved, imperforate; both valves convex.

1. P. *Knightii.*—Circular, with many longitudinal furrows; tripartite valve much depressed, with a short slightly incurved beak; bipartite valve conical, gradually produced into a long incurved beak.—*Sower.* Min. Conch. t. xxviii. upper figure.—*Carboniferous Limestone.*

2. P. *Aylesfordii.*—Nearly circular, with longitudinal furrows; tripartite valve convex, with a prominent incurved beak; bipartite valve gibbous, incurved, conical, with a much incurved beak.—*Sower.* Min. Conch. t. xxix.—*Carboniferous Limestone.*

3. P. *levis.*—Smooth, triangular, front rounding beaks incurved.—*Sower.* Min. Conch. t. xxviii. right hand figure.—*Carboniferous Limestone.*

GEN. PRODUCTUS.—Shell bivalve, equilateral, inequivalve; hinge transverse; one valve convex, the other flat or concave.

1. P. *longispinus.*—Eared; convex valve gibbous, with a mesial depression, the other valve concave; hinge long; the convex valve with several unequal cylindrical hollow spines; obsoletely ribbed longitudinally with transverse wrinkled layers of growth.—Anomiæ echinatæ, *Ure* Ruth. 314. t. xv. f. 4.—Prod. long. *Sower.* Min. Conch. lxviii. f. i.— P. *Flemingii*, Ib. f. 2.—*Carboniferous Limestone.*

2. P. *spinosus.*—Roundish, very gibbose, obsoletely ribbed; destitute of the mesial depression; convex valve with many strong spines.—*Sower.* Min. Conch. t. lxix. f. 2.—In *Carboniferous Limestone.*

3. P. *spinulosus.*—Semicircular, flattish; hinge long and straight; convex valve gibbous towards the beak, with many small spines spread over it; the other valve also spinous, with irregular depressions, and very concave.—*Sower.* Min. Conch. t. lxviii. f. 3.—*Carboniferous Limestone.*

4. P. *aculeatus.*—Roundish, concave valve smooth; the other with adpressed reflected spines; gibbous; front slightly indented; hinge half the breadth of the shell.—Anomites acul. *Mart.* Derb. t. xxxvii. f. 9, 10.—P. acul. *Sower.* Min. Conch. t. lxviii. f. 4.—*Carboniferous Limestone.*

5. P. *scabriusculus.*—Nearly round, flat valve obscurely punctato-striated, the other gibbous, marked with longitudinal striæ, and prominent tubercles ranged nearly in quincunx order; hinge straight, equal to the breadth of the shell.—Anomites scab. *Mart.* Derb. t. xxxvi. f. 5. P. scab. *Sower.* Min. Conch. t. lxxix. f. 1.—*Carboniferous Limestone.*

6. P. *scoticus.*—Semicircular, with fine longitudinal striæ and a few obsolete spines, gibbous towards the beak; sides expanded into the line of the hinge, with a mesial depression; hinge nearly twice the length of the shell. —*Sower.* Min. Conch. t. lxix. f. 3. and P. antiquatus, *Ib.* t. cccxvii. f. 1, 5, 6. —*Carboniferous Limestone.*

7. P. *Martini*.—Semicylindrical, convex above, with a flattened front, deeply striated; a few spines; lesser valve nearly flat, deeply inserted; hinge line equal to the width of the shell.—Ammonites prod. *Mart.* Derb. t. xxii. f. 1, 2, 3. P. Martini, *Sower.* Min. Conch. t. cccxvii. f. 2, 3, 4; and P. concinnus, *Ib.* t. cccxviii. f. i.—In *Carboniferous Limestone*, common.

8. P. *lobatus*.—Convex valve with a mesial groove; spines few; the ribs coarser, and the sides more compressed than the preceding species, with which it may be readily confounded.—*Sower.* Min. Conch. t. cccxviii. f. 2–6; and P. sulcatus, *Ib.* t. cccxix. f. 2.—In *Carboniferous Limestone.*

9. P. *horridus*.—Quadrangular, with a large furrow along the middle, eared, thorny; ears prominent, subcylindrical; beak much incurved, large.—*Sower* Min. Conch. t. cccxix. f. 1.—In *Magnesian Limestone.*

10. P. *humerosus*.—Oblong, squarish, depressed, striated, spinose? or hispid? hinge line less than the width of the valve; in the larger valve are two very deep cavities near the beak, and a third connected with the beak; front flattish.—*Sower.* Min. Conch. t. cccxxii.—In *Magnesian Limestone.*

11. P. *giganteus*.—Transversely oblong, with dilated sides and rugose irregular striæ, longitudinally undulated or sulcated; larger valve gibbose.—Amonites giganteus, *Mart.* Derb. t. xv. P. gig. *Sower.* Min. Conch. t. cccxx. —*Carboniferous Limestone.*

12. P. *crassus*.—Rounded, longitudinally sulcated, and striated; striæ tubercular; sides not dilated.—Ammonites crassus, *Mart.* Derb. t. xvi.—*Carboniferous Limestone.*

13. P. *personatus*.—Hemispherical, irregularly striated, beneath very concave; within the larger valve are three deep cavities, one connected with the beak, and two remote.—*Sower.* Min. Conch. t. cccxxi.—*Carboniferous Limestone.*

14. P. *punctatus*.—Shell rounded, slightly elongated, with a shallow mesial depression transversely sulcated; the anterior part of the furrows and the ridges thickly covered with long cylindrical spines, concealing the shell.—Conchæ pilosæ, *Ure*, Ruth. 316. t. xv. f. 7. Anomites punctatus, *Mart.* Derb. t. xxxvii. f. 6, 7, 8. P. punct. *Sower.* Min. Conch. t. cccxxiii.—In *Carboniferous Limestone.*

15. P. *fimbriatus*.—Shell slightly elongated, rounded, gibbous towards the apex, with rather distant transverse ridges; thinly spinous.—*Sower.* Min. Conch. t. ccccliх. f. 1.—*Carboniferous Limestone.*

16. P. *semireticulatus*.—Semiorbicular, with a shallow mesial depression; longitudinally striated, the striæ rude, strong, and unequal; transversely wrinkled.—Anomites semi. *Mart.* Derb. t. xxxii. f. 1–4.—In *Carboniferous Limestone.*

17. P. *hemisphæricus*.—Hemispherical, longitudinally striated; striæ fine; lower valve very concave.—*Sower.* Min. Conch. t. cccxxviii.—*Carboniferous Limestone.*

18. P. *comoides*.—Semicircular, gibbose, very finely striated; disk inflated; back straight, extending the whole width of the shell.—*Sower.* Min. Conch. t. cccxxx.—*Carboniferous Limestone.*

19. P. *latissimus*.—Transverely oblong, depressed, coarsely striated; beak much incurved; hinge line very long.—*Sower.* Min. Conch. t. cccxxx.—*Carboniferous Limestone.*

20. P. *plicatilis.*—Transversely oblong, convex above, depressed in the middle, longitudinally striated and transversely wrinkled, spinose; front smooth.—*Sower.* Min. Conch. t. cccclix. f. 2.—*Carboniferous Limestone.*

21. P. *depressa.*—Nearly semicircular, depressed, corrugated, longitudinally striated; upper portion convex near the beak, concave near the margin; front abruptly descending.—*Sower.* Min. Conch. t. cccclix. f. 3.—*Carboniferous Limestone.*

The species of this genus, appear to have a strong analogy with the *Brachiopoda* in the singular shagreened aspect of the shell externally, when well preserved; and in the process which rises vertically, into the cavity, from the inside of the concave valve, besides several elevations near the hinge. It is probable that all the *Producti* and *Pentameri* were free shells.

BIVALVIA.

ASIPHONIDA.

Cloak open, like the aperture of the shell, and permitting the water to come immediately in contact with the mouth and gills. The margin of the cloak has a double fringe of filaments.

I. *Valves closed by one adductor muscle.*

- A. Shell free, or adhering to other bodies by a byssus only; furnished with a foot.
  - *a.* Ligament narrow, and confined to a space under the beaks. **Pectenidæ.**
    - *b.* Shell compact.
      - Pecten.
      - Lima.
      - *Plagiostoma.*
      - (Pedum.)
    - *bb.* Shell foliated.
      - *Gryphæa.*
      - (Vulsella.)
      - (Placuna.)
  - *aa.* Ligament marginal, sublinear, simple or interrupted by the hinge teeth or pits; shell foliated. **Pernadæ.**
    - *Perna.*
    - *Gervillea.*
    - *Crenatula.*
    - *Inoceramus.*
    - (Malleus.)
- AA. Shell fixed or cemented to other bodies; inequivalve.
  - *a.* Hinge plain or destitute of teeth. *Ostreadæ.*
    - Ostrea.
    - *Dianchora.*
    - (Hinnites.)
    - Anomia.
  - *aa.* Hinge furnished with teeth. *Spondylidæ.*
    - *Spondylus.*
    - *Plicatula.*

II. *Valves closed by two adductor muscles.*

A. Hinge with teeth.

- *a.* Teeth numerous in both valves.
  - *b.* Teeth of the hinge simple. ARCADÆ.
    - *c.* Hinge teeth on a straight line; a transverse area between the beaks.
      - Arca.
      - *Cucullea.*
    - *cc.* Hinge-teeth on a bent line.
      - Pectunculus.
      - Nucula.
  - *bb.* Teeth of the hinge transversely striated. *Trigoniadæ.*
    - *Trigonia.*
    - (Castalia.)
- *aa.* Hinge with a single tooth.
  - Avicula.

AA. Hinge without teeth.

- (Meleagrina.)
- Pinna.

PECTENIDÆ.

GEN. XCIV. PECTEN. SCALLOP.—Shell suborbicular; beaks approximate; ligament internal, seated in a triangular cavity, a byssus issuing under the ear of the right valve; foot small, pedunculated; mouth with branched tentacula.

* *Ears of the shell equal, or nearly so.*

371. P. *maximus*.—The left or upper valve flat, depressed towards the beak, the ribs rounded and striated longitudinally.

List. An. Ang. 184. Conch. t. clxiii.—Ostrea maxima, *Linn.* Syst. i. 1144.—P. max. *Penn.* Brit. Zool. iv. 99. t. lix. f. 61. *Mont.* Test. Brit. 143. *Turt.* Bev. 207.—Gregarious on many parts of the coast.

Length about 5 inches; under valve whitish, upper valve variegated with brown; ribs 12 to 16, longitudinally grooved and transversely striated. Dredged and used as food; it is said by old fishermen, to be taken in greatest quantity after a fall of snow.

372. P. *Jacobæus*.—The upper valve flat, depressed towards the beak, the ribs rounded and destitute of longitudinal striæ.

P. magnus, *List.* Conch. t. clxv.—Ostrea Jac. *Linn.* Syst. i. 1144.—P. Jac. *Penn.* Brit. Zool. iv. 100. t. lx. f. 62. *Mont.* Test. Brit. 144. *Turt.* Biv. 208.—On the coast of England, rare.

Length about 3 inches; lower valve white, upper valve rufous; ribs about 16, in the upper valve rough, subquadrangular, with a few longitudinal grooves, the interstices nearly smooth; the ribs in the lower valve rounded, and, together with the grooves, transversely striated.

373. P. *opercularis*.—The left valve convex; ribs rounded, nearly smooth.

P. tenuis, *List.* An. Ang. 185. Conch. t. cxix.—P. oper. *Linn.* Syst. i. 1147.—P. subrufus, *Penn.* Brit. Zool. iv. 100. t. lx. f. 63.—P. oper. *Mont.* Test. Brit. 145. *Turt.* Biv. Brit. 209. and P. subrufus, p. 210. —Common on oyster beds.

Breadth from 2 to 3 inches; coloured plain or variegated; ribs about 18, the whole shell obsoletely striated longitudinally, and finely striated transversely, especially in the furrows.

374. P. *lineatus*.—The left valve convex; a red line along the rough ridge of each rib.

(Da Costa, Brit. Conch. 147. t. x. f. 8.) *Pult.* Dorset. 36.—Ostrea lin. *Don.* Brit. Shells, t. cxvi.—Southern coast of England.

This shell is smaller than the preceding, the sides do not rise quite so high towards the ears; and the ribs are much finer. It seems to have been first noticed by Dr Pultney. Dr Turton considers it as a variety of *P. opercularis.*

375. P. *sinuosus.*—Distorted with numerous foliated or spinous rays.

P. minimus, angustior, *List.* An. Ang. 186. Conch. t. clxxii. and clxxxix. —*Wallace*, Ork. 44.—P. Pusio, *Penn.* Brit. Zool. iv. 101. t. lxi. f. 65. P. distortus, *Mont.* Test. Brit. 148.—P. sinuosus, *Turt.* Biv. Brit. 210. —In crevices of sea rocks.

Length seldom two inches, and breadth an inch and a half; colour various; lower valve convex, the left nearly flat, especially towards the extremity; ribs numerous, unequal, and covered with foliaceous spines along the layers of growth. This species, when lodging in the crevices of rocks, is apt, like the *Mytili*, to become distorted by confinement; a circumstance which has led some naturalists to believe (though they admit the existence of a *byssus*,) that the shell is attached by its lamellar spines, to the rock; and that it belongs to the genus HINNITES of De France.

376. P. *glaber.*—Shell with seven obsolete ribs and intermediate longitudinal striæ, nearly smooth.

Penn. Brit. Zool. iv. 102. *Mont.* Test. Brit. Sup. 59. t. xxviii. f. 6.—Anglesea and Firth of Forth, rare.

Length and breadth about an inch, mottled with brown and yellow, or plain; the largest ear reticulated, the other striated; the valves are rather flat; minutely striated concentrically by the layers of growth; inside with 21 slender rays, the middle ones in fours.

377. P. *tumidus.*—" Shell equivalve, inequilateral, quite smooth, with one of the sides produced."

Turt. Biv. Brit. 212. t. xvii. f. 3.—Taken from the Serpula tubularia, in Torbay.

" Shell a quarter of an inch in diameter, orbicular; glossy white, transparent, and without striæ, ribs, or marks of any kind; the sides are not equal, in consequence of one of them being prominent in a rounded manner: ears very nearly equal."

** *Ears of the shell unequal.*

378. P. *varius.*—Ribs thirty-two, rounded, with numerous scaly spines.

P. subrufus, *List.* Conch. t. 180.—Ostria var. *Linn.* Syst. i. 1146.—Pecten var. *Penn.* Brit. Zool. iv. 101. t. lxi. f. 64. *Mont.* Test. Brit. 146. *Turt.* Biv. Brit. 214.—On oyster beds.

Length upwards of two inches; white, red, or mottled; spinous scales concave on the layers of growth; furrows finely reticulated.

379. P. *niveus.*—Ribs forty-two, rounded, with few scaly spines.

Macgillivray, Edin. Phil. Journ. vol. xiii. 166. t. iii. f. 1.—From the outer Hebrides.

This species differs from the preceding in the pure whiteness of its colour; the greater number of its ribs, with their few scaly spines, and in the furrows being marked with transverse waved striæ, instead of reticulations. I owe the specimen in my possession to the kind attention of Mr Macgillivray.

380. P. *Pusio.*—" Shell oblong oval equivalve, with forty rounded and nearly smooth striæ, which are alternately smaller."

P. parvus, *List.* Conch. t. clxxxix.—Ostrea Pusio, *Linn.* Syst. i. 1146.—Pecten Pusio, *Turt.* Biv. Brit. 215. t. xvii. f. 2.—From the rocks in Torbay.

" Shell ⅝ths of an inch long, and ½ an inch broad; brownish-white, with chocolate transverse zigzag bands, often saffron or crimson, but variable in colours; the under valve usually clear white; with about 40 fine rounded striæ, which are mostly alternately larger and smaller, and very slightly muricate about the margin."—*Turton.*

381. P. *Islandicus.*—Ribs numerous, rough, unequal, irregularly grouped.

List. Conch. t. MLVII. f. 4. *Turt.* Conch. Dict. 258. Biv. Brit. 216.—West coast of Scotland.

Length upwards of 3 inches; colour reddish; ribs from 70 to 100, with rough scales, the ribs are grouped in pairs or otherwise; the furrows are reticulated. A specimen in my possession, from the silt of the Clyde, given me several years ago by Mr Laskey, is 3½ inches in length, and 3 inches in breadth.

382. P. *obsoletus.*—Surface of the shell delicately shagreened.

Penn. Brit. Zool. iv. 102. t. lxi. f. 66. *Don.* Brit. Shells, t. i. f. 2. *Mont.* Test. Brit. 149. Sup. 57.—Ostrea lævis, *Maton* and *Rackett*, Linn. Trans. viii. 100. t. iii. f. 5.—P. ob. *Turt.* Biv. Brit. 213. t. ix. f. 6.—In sandy bays.

Shell rarely exceeding an inch in diameter; colour purple, or mottled with brown; surface sometimes even, with obsolete ridges, or with the margin regularly ribbed; but in all cases the reticulated surface, when seen by a lens, is a sufficiently distinguishing mark of this, otherwise, variable species.

383. P. *lævis.*—Smooth and glossy, with unequal striated ears.

Penn. Brit. Zool. iv. 102. *Mont.* Test. Brit. Sup. 61. *Turt.* Biv. Brit. 212.—Western coasts of England.

Diameter about half an inch; colour white; slightly and irregularly wrinkled concentrically; thin, and semitransparent.

384. P. *similis.*—Shell thin, semitransparent, smooth, beautifully clouded with brown, of a compressed globose form, with unequal ears.

Laskey, Wern. Mem. i. 387. t. viii. f. 8.—Found in the Frith of Forth.

The under side of the shell is more prominent than the upper. The *P. tumidus* is probably only a variety of this species.

* * *

EXTINCT SPECIES.

1. P. *quadricostata.*—Triangular, nearly even, front semicircular, margin notched; convex valve ribbed, larger costæ six, three smaller between each; posterior auricle large.—*Sower.* Min. Conch. t. lvi. f. 1, 2.—In *Green Sand.*

2. P. *quinquecostata.* — Subtriangular, rather oblique, front semicircular,

toothed; convex valve gibbous, ribbed, principal costæ 6, with 4 lesser ones between each; surface finely transversely striated; upper valve flat-toothed. —*Sower.* Min. Conch. t. lvi. f. 4–8.—In *Chalk* and *Green Sand.*

3. P. *æquivalvis.*—Lenticular, with rounded diverging ribs, and many acute concentric striæ; valves equally convex, the lower one smoothest; ears equal.—*Sower.* Min. Conch. t. cxxxvi. f. i.—*Under Oolite.*

4. P. *fibrosus.*—Depressed, orbicular, with a rectangular beak, nine or ten broadish diverging grooves, and numerous sharp concentric striæ; ears equal, rectangular; margin undulated internally.—*Sower.* Min. Conch. t. cxxxvi. f. 2.—*Under Oolite.*

5. P. *Beaveri.*—Depressed, orbicular, smooth, with irregular longitudinal costæ; ears as wide as the shell, nearly equal.—*Sower.* Min. Conch. t. clviii. —*Chalk Marl.*

6. P. *orbicularis.*—Orbicular, much depressed, concentrically striated; striæ elevated, sharp; one valve smooth; ears nearly equal, broadest at the base. *Sower.* Min. Conch. t. clxxxvi.—In *Green Sand.*

7. P. *corneus.*—Orbicular, much depressed, smooth; ears small, nearly equal; two obtuse teeth near the ear within each valve.—*Sower.* Min. Conch. t. cciv.—*London Clay.*

8. P. *obscurus.*—Suborbicular, depressed, with obscure arched longitudinal rugæ upon the surface; ears large.—*Sower.* Min. Conch. t. ccv. f. 1.—*Under Oolite.*

9. P. *lens.*—Orbicular, convex; surface marked with diverging arched striæ; striæ deeply punctured.—*Sower.* Min. Conch. t. ccv. f. 2, 3.—*Under Oolite.*

10. P. *laminatus.*—Suborbicular, depressed, striated; striæ arched, diverging; ears triangular, unequal; the largest plaited.—*Sower.* Min. Conch. t. ccv. f. 4.—*Under Oolite.*

11. P. *arcuatus.*—Orbicular, depressed, with arched, punctured, and diverging striæ upon the surface; ears large; the side beneath the largest is arched.—*Sower.* Min. Conch. t. ccv. f. 5–7.—*Middle Oolite.*

12. P. *similis.*—Suborbicular, depressed, striated; striæ arched, diverging; ears unequal; sides straight.—*Sower.* Min. Conch. t. ccv. f. 6.—*Under Oolite.*

13. P. *rigidus.*—Orbicular, depressed; strongly striated; striæ arched, diverging; ears large, unequal, decussated.—*Sower.* Min. Conch. t. ccv. f. 8.—*Under Oolite.*

14. P. *barbatus.*—Orbicular, depressed, transversely striated; rays fourteen, those upon one valve spinose; spines long, acute, depressed; ears nearly equal.—*Sower.* Min. Conch. t. ccxxxi.—*Under Oolite.*

15. P. *lamellosus.*—Orbicular, convex, with concentric erect lamellæ upon the surface, and diverging striæ near the beaks; ears large, distinct.—*Sower.* Min. Conch. t. ccxxxix.—*Upper Oolite.*

16. P. *papyraceus.*—Depressed, obliquely oval, with large unequal rectangular ears; numerous elevated striæ, decussated by the lines of growth; shell thin.—*Sower.* Min. Conch. t. cccliv.—In shale of the *Coal formation.*

17. P. *asper.*—Nearly orbicular, convex on both sides, bearing about seventeen sets of rays (from five to seven in each, according to the age of the shell), roughened by subtubular imbricated scales; margin internally fimbriato-crenated; ears distinct, nearly equal.—*List.* Conch. t. ccclxx.—*Sower.* Min. Conch. t. ccclxx. f. 1.—In *Green Sand.*

18. P. *obliquus.*—Obliquely oval, convex on both sides; radii very numerous, roughened by semicircular imbricated scales; ears large, distinct.—*Sower.* Min. Conch. t. ccclxx. f. 2.—In *Green Sand.*

19. P. *cinctus.*—Orbicular, gibbose, longitudinally striated, imbricated; edges of the laminæ thin, erect; ears small; edge entire.—*Sower.* Min. Conch. t. ccclxxi.—*Under Oolite?*

20. P. *sulcatus.*—Obliquely orbicular, with twenty obscurely tripartite rays, the intermediate spaces longitudinally striated, the whole rough with minute scales; internally sulcated; ears nearly equal.—*Sower.* Min. Conch. t. cccxciii. f. 1.—*Suffolk Crag.*

21. P. *gracilis.*—Orbicular, thin, convex, with many small longitudinal ridges, concentrically striated; striæ close, elevated, sharp; ears unequal; margin entire.—*Sower.* Min. Conch. t. cccxciii. f. 2.—In *Crag.*

22. P. *striatus.*—Oval, convex; valves nearly equal, with numerous smooth or scaly ridges; within plain, margin entire; ears equal, rather large.—*Sower.* Min. Conch. t. cccxciv. f. 2, 3, 4.—In *Crag.*

23. P. *nitidus.*—Obovate, one valve nearly flat, with numerous, nearly smooth ridges, the interstices minutely striated transversely, the other valve convex, with as many crenulated ridges; margin entire; ears nearly equal. —*Mant.* Suss. 202. t. xxvi. f. 4–9.—*Sower.* Min. Conch. t. cccxciv. f. 1.—In *Chalk.*

24. P. *obsoletus?*—Equivalved; ears very unequal; surface finely striated; striæ obliquely diverging.—*Sower.* Min. Conch. t. dxli.—In *Crag.*

25. P. *princeps.*—Orbicular, compressed; decorated with ninety rounded nearly equal radii, surmounted with erect concave scales; ears large, unequal, squamose; valves equal.—*Sower.* Min. Conch. t. dxlii. f. 2.—In *Crag.*

26. P. *annulatus.*—Orbicular, convex; numerous thin, erect, concentric laminæ, and fine longitudinal striæ ornament the surface, passing over the large ears.—*Sower.* Min. Conch. t. dxlii. f. 1.—*Lower Oolite.*

27. P. *vimineus.*—Convex, rather longer than wide, concentrically striated; ribs about twenty, prominent, close beset with thick elevated scales, which are less numerous upon the left valve; ears nearly equal. (*P. varius*, Geol. Surv. Yorksh. 223. t. ix. f. 9.)—*Sower.* Min. Conch. t. dxliii. f. 1, 2.—*Lower Oolite.*

28. P. *vagans.*—Rather convex, a little longer than wide; ribs eleven, large, convex, decorated with large erect concave scales, that are very close upon the right, but distant upon the left, valve; ears nearly equal, crossed by larger scales.—(*P. sulcatus*, Geol. Surv. York. 233. t. ix. f. 3.)—*Sower.* Min. Conch. t. dxliii. f. 3, 4, 5.—*Lower Oolite.*

29. P. *triplicatus.*—Subtriangular, longitudinally striated, with three deep, longitudinal furrows, which form angular plicæ on the front; margin crenulated.—*Mant.* Geol. Suss. 128. t. xxv. f. 9.—In *Grey Chalk Marl.*

30. P. *laminosus.*—Suborbicular, much depressed, concentrically laminated, ears nearly equal.—*Mant.* Geol. Suss. 128. t. xxvi. f. 8.—In *Grey Chalk Marl.*

31. P. *dissimilis.*—Suborbicular, slightly lengthened, the right or lower valve with numerous ribs, slightly scaly; ears nearly equal, ribbed transversely and longitudinally; the left or upper valve concave, regularly marked concentrically with flat obsolete ribs, which become scaly in crossing the longitudinally ribbed ears. In my cabinet, from the shale and limestone of the *Independent Coal formation.*—In the concavity of the left valve, it agrees with the recent *P. marinus* and *P. Jacobæus.*

GEN. XCV. **LIMA.**—Shell longitudinally oblong, with ears; beaks remote; ligament external.

385. L. *fragilis.*—Shell with irregular longitudinal rough ribs; the ears oblique.

Pecten frag. *Mont.* Test. Brit. Sup. 62.—L. bullata, *Turt.* Biv. Brit. 217. t. xvii. f. 4, 5.—On different parts of the coast, rare.

Length sometimes exceeding an inch and a half; breadth an inch; white; valves equal, little raised; one side with the edge straight; the other arcuated; ribs numerous, unequal, irregularly grouped, most prominent on the middle of the shell, and rendered rough by the irregular lines of growth; margin nearly smooth; beaks prominent. This shell (which may prove a var. of *Ostrea glacialis* of Poli, Test. 11. t. xxviii. f. 19, 20.) was observed by Montagu on the coast of Devon, afterwards by Dr Turton, at Bray, in Ireland; and more recently on the coast of Scotland, near Appin, by Captain Carmichael.—A single valve, communicated by the last observer, is $1\frac{6}{10}$ths of an inch in length.

386. L. *subauriculata.*—Shell finely striated longitudinally, the ears nearly rectangular.

Pecten sub. *Mont.* Test. Brit. Sup. 63. t. xxix. f. 2.—L. sub. *Turt.* Biv. Brit. 218.—On different parts of the coast, from Devon to Zetland, rare.

Length $\frac{2}{8}$ths; breadth $\frac{1}{8}$th of an inch; pellucid, nearly equilateral; two conspicuous mesial opake striæ; margin slightly crenulated.

EXTINCT SPECIES.

1. L. *gibbosa.*—Elongated, gibbose, smooth, longitudinally plicate in the middle; ears undefined.—*Sower.* Min. Conch. t. clii.—*Under Oolite.*

2. L. *rudis.*—Obovate, oblique, with seven longitudinal costæ; anterior ear open with thickened lobes.—*Sower.* Min. Conch. t. ccxiv. f. 1.—*Middle Oolite.*

3. L. *antiquata.*—Elliptical, depressed, coarsely striated; anterior ear deeply wrinkled, open.—*Sower.* Min. Conch. t. ccxiv. f. 2.—In *Lias.*

4. L. *proboscidea.*—Broad, ovate, convex, with twelve ribs, each furnished with several large tubular processes; ears small.—*Sower.* Min. Conch. t. cclxiv.—*Inferior Oolite.*

GEN. **PLAGIOSTOMA.**—"An oblique eared bivalve; hinge destitute of teeth or internal pit; line of the hinge straight in one valve, in the other deeply cut by an angular sinus." —(*Sowerby.*)

1. P. *giganteum.*—Smooth, depressed, deltoid, with the posterior side rounded in to the front; ears small, anterior one longest, placed in a large broad and straight furrow; beaks pointed; surface obscurely marked with diverging striæ.—*Sower.* Min. Conch. t. lxvii.—In *Lias.*

2. P. *spinosum.*—Obovate, longitudinally furrowed; sides nearly equal,

straightish; one valve spinous, spines half the length of the shell.—*Sower.* Min. Conch. t. lxxxiii.—In *Chalk.*

3. P. *punctatum.*—Depressed, obliquely ovate, with numerous diverging striæ; anterior side long, straight; ears nearly equal; diverging striæ transversely marked with other very fine striæ or points.—*Sower.* Min. Conch. t. cxiii. f. 1, 2.—In *Lias.*

4. P. *cardieforme.* — Gibbous, nearly circular, longitudinally furrowed, smooth; anterior side short, straight; wings equal.—*Sower.* Min. Conch. t. cxiii. f. 3.—In *Oolite.*

5. P. *rigidum.*—Gibbous, obliquely ovate, with many diverging sharp threadlike ribs, and very minute intervening transverse striæ; anterior side long, straight, very concave; ears nearly equal.—*Sower.* Min. Conch. t. cxiv. f. 1. —In *Oolite.*

6. P. *ovale.*—Rather gibbous, oblique, elongated, oval, with many small ribs, and minute intervening transverse striæ; anterior side concave, slightly recurved.—*Sower.* Min. Conch. t. cxiv. f. 3.—In *Oolite.*

7. P. *obscurum.*—Rather gibbous, oblique, ovate, smooth, externally ribbed? with twenty-five internal sulci; anterior side flattish; beaks prominent.—*Sower.* Min. Conch. t. cxiv. f. 2.—In *Oolite.*

8. P. *pectinoides.*—Depressed, a little oblique, obovate, rather angular at the back; beak pointed; surface with twenty or more carinated ribs, transversely striated; internally plain; margin toothed.—*Sower.* Min. Conch. t. cxiv. f. 4.—In *Lias.*

9. P. *Hoperi.*—Transversely ovate, oblique, valves convex, obscurely punctato-striated; striæ diverging, deepest upon the sides; anterior slope straight, concave.—*Mant.* Suss. 204. t. xxvi. f. 2, 3-15.—*Sower.* Min. Conch. t. ccclxxx. —In *Chalk.*

10. P. *rusticum.*—Transversely oblong, oblique, longitudinally sulcated; valves convex; sulci deep; ears obscure; anterior slope straight, convex along the middle.—*Sower.* Min. Conch. t. ccclxxxi.—In *Oolite.*

11. P. *læviusculum.*—Transversely obovate, oblique, convex, longitudinally ribbed; ribs close, broad, irregular, very little elevated, convex; anterior slope straight, hollow; ears small, unequal.—*Sower.* Min. Conch. t. ccclxxxii. —In *Oolite.*

12. P. *Brightoniensis.*—Obovate, depressed, longitudinally costated; posterior side eared; anterior side lunulate, concave, small, acuminated; margin crenulated.—*Mant.* Suss. cciv. t. xxv. f. 15.—*Upper Chalk.*

GEN. GRYPHÆA.—Inequivalve; larger valve concave; with a large involutely curved subspiral beak; lesser valve nearly flat; hinge a transversely striated pit, with an internal ligament.

1. G. *incurva.*—Elongated, very involute, right side an obscure lobe; lesser valve oblong, externally concave.—*Park.* Org. Rem. iii. 209. t. xv. f. 3.—In *Lias.*

2. G. *obliquata.*—Oblong, slightly involute, oblique; right side an obscure lobe; lesser valve irregularly ovate, externally concave.—*Sower.* Min. Conch. t. cxii. f. 3.—In *Lias.*

3. G. *dilatata.*—Orbicular, obscurely lobed; upper valve flat, lower valve hemispherical.—*Sower.* Min. Conch. t. cxlix. f. 1. var. ib. f. 2.—In *Oolite.*

4. G. *sinuata.*—Suborbicular; one side cuneiform; beaks very small, laterally incurved; one valve convex, subcarinated; the other nearly flat, with a sinus above the angle of the cuneiform side; hinge-pit marginal, long, narrow, and curved.—*Sower.* Min. Conch. t. cccxxxvi.—*Iron Sand.*

5. G. *bullata.*—Transversely obovate, irregular, smooth, thin, depressed, beaks small; upper valve concave; lateral lobe obscure, when old.—*Sower.* Min. Conch. t. ccclxviii..—*Middle Ooolite.*

6. G. *vesiculosa.* — Subrhomboidal, oblong, deep; lesser valve concave, small, thin; larger valve curved, composed of several distant coats.—*Sower.* Min. Conch. t. ccclxix.—In *Green Sand.*

7. G. *columba.*—Ovate, rounded, expanded posteriorly, smooth; beak attenuated, incurved, oblique.—*Sower.* Min. Conch. t. ccclxxxiii. f. 1, 2.—In *Green Sand.*

8. G. *nana.*—Oblong, ovate, rugged, gibbose, beak oblique, incurved; upper valve pointed, thick.—*Sower.* Min. Conch. t. ccclxxxiii. f. 3.—*Middle Oolite.*

9. G. *gigantea.*—Orbicular, rather smooth; upper valve thin, concave; lower valve convex, with a small, sharp, incurved beak; hinge small.—*Sower.* Min. Conch. t. cccxci.—*Under Oolite.*

10. G. *Maccullochii.*—Obovate, oblique, gibbose; beak produced, much incurved; posterior lobe more or less distinct; the front rather angular.—*Sower.* Min. Conch. t. DXLVII. f. 1, 2, 3.—In *Oolite.*

11. G. *minuta.*—Orbicular, gibbose; beak spiral; lobe obscure.—*Sower.* Min. Conch. t. DXLVII. f. 4.—In *Oolite.*

PERNADÆ.

GEN. PERNA.—Shell subequivalve, oblique; hinge with numerous transverse parallel teeth, receiving the ligament in the interstices; a sinus at the beak for the passage of the byssus.

1. P. *quadrata.* — Quadrilateral, one side shorter than the other three; valves gibbose, unequal, the shorter side very concave, bounded by two obtuse carinæ; beaks prominent. — *Sower.* Min. Conch. t. ccccxcii.—*Under Oolite.*

GEN. GERVILLIA.—Shell inequivalve, inequilateral, beaks near the anterior extremity; hinge long, with numerous pits and lamelliform teeth for the reception of the ligament.

1. G. *solenoides.*—Transversely much elongated, depressed, smooth; edges parallel; anterior extremity truncated, open; teeth of the hinge numerous, variously disposed.—*Sower.* Min. Conch. t. DX. f. 1-4.—In *Green Sand.*

2. G ? *acuta*.—Ovate lanceolate, oblique, narrow, depressed, slightly curved; anterior extremity acute; teeth in the hinge variously disposed.—*Sower.* Min. Conch. t. DX. f. 5.—In *Calcareous Sandstone*, at Collyweston.

3. G. *aviculoides*.—Obliquely ovato-lanceolate, curved; both extremities pointed; hinge-line nearly half the length of the shell; hinge-teeth few.—*Sower.* Min. Conch. t. lxi. and t. Dlxvi.—In *Green Sand* and *Oolite*.

GEN. CRENATULA.—Shell subequivalve, depressed; hinge with numerous pits, without teeth for the reception of the ligament.

1. C. *ventricosa*.—Ovate, elongated, ventricoso-carinated; posterior side impressed; beaks pointed.—*Sower.* Min. Conch. t. ccccxliii ?

2. C. *Listeri*.—*List.* Conch. t. ccccIxvii. f. 34–6.—*Park.* Org. Rem. iii. 220. t. xv. f. 5.—*Upper Oolite.*

3. C. *producta*.—*Park.* Org. Rem. iii. 221. t. xv. f. 6, 7.—" In a *Marl-pit* near Shefford, in Bedfordshire."

GEN. INOCERAMUS.—Shell inequilateral, irregular; hinge a marginal, subcylindrical, transversely sulcated callus, supporting a ligament; beaks conspicuous at one end of the hinge.

1. I. *Cuvieri*.—Obovate, curved, convex, with transverse, distant, obtuse waves; posterior side concave, with a small lobe near the beak.—*Sower.* Linn. Trans. xiii. 457.—*Mant.* Suss. 213. t. xxvii. f. 4. t. xxviii. f. 1–4.—Catillus Cuvieri, *Cuvier*, Oss. Foss. ii. 251. t. iv. f. 10.—*Sower.* Min. Conch. t. ccccxli. f. 1.—In *Chalk*.

2. I. *Brongniarti*.—Oblong, gibbose, with large transverse undulations; anterior side angular, lobed; posterior side flat, truncated and smooth; beaks small, curved, and pointed.—*Mant.* Suss. 214. t. xxvii. f. 8.—*Sower.* Min. Conch. t. ccccxli. f. 2, 3.—In *Chalk.*

3. I. *mytiloides*.—Equivalved, elongated, depressed, with slight irregular waves; convex and obtuse towards the beaks; hinge-line oblique; anterior side produced; beaks short.—*Mant.* Suss. 215. t. xxviii. f. 2.—*Sower.* Min. Conch. t. ccccxlii.—In *Chalk.*

4. I. *cordiformis*.—Equivalved, heart-shaped, transversely and interruptedly waved; beaks large, incurved; anterior side angular.—*Sower.* Min. Conch. t. ccccxl.—In *Chalk.*

5. I. *concentricus*.—Unequivalved, ovate, one of the beaks much produced, incurved.—(*Park.* Geol. Trans. v. 58. t. i. f. 4.)—*Sower.* Min. Conch. t. cccv. —In *Chalk Marl.*

6. I. *sulcatus*.—Unequivalved, oblong, with prominent beaks, and about nine large longitudinal plaits; beak of one valve, incurved, acute.—(*Park.* Geol. Trans. v. 59. t. i. f. 5.)—*Sower.* Min. Conch. t. cccvi.—In *Chalk Marl.*

7. I. *Lamarkii*.—Valves equal, very convex, with a few obscure longitudinal undulations, and distant transverse ridges; surface covered with numerous concentric striæ; posterior slope subdepressed; anterior side lobate, expanded; hinge nearly transverse.—(*Park.* Geol. Trans. v. 55.)—*Mant.* Suss. 214. t. xxvii. f. 1.—In *Chalk.*

8. I. *latus.*—Valves convex near the beaks, flat and expanded towards the front; surface marked with distant transverse ridges, and numerous concentric striæ; posterior slope smooth, depressed? anterior side expanded; hinge oblique.—*Mant.* Suss. 216. t. xxvii. f. 10.—In *Chalk.*

9. I. *Websteri.*—Convex, smooth, with distant, irregular, transverse ridges; beaks rounded, posterior slope nearly flat; anterior side expanded; hinge very oblique.—*Mant.* Suss. 216. t. xxvii. f. 2.—In *Chalk.*

10. I. *striatus.*—Gibbous, rounded, even, with numerous transverse striæ; hinge oblique?—*Mant.* Suss. 217. t. xxvii. f. 5.—In *Chalk.*

11. I. *undulatus.*—Convex, marked with numerous regular transverse elevations and depressions; posterior slope truncated; hinge side expanded.—*Mant.* Geol. 217. t. xxvii. f. 6.—In *Chalk.*

OSTREADÆ.

GEN. XCVI.—OSTREA.—Shell inequivalve, irregular, ligament half internal, placed in a pit, which, in the fixed valve, increases with age, as the upper valve is displaced and advanced.

387. O. *edulis.*—Shell roundish-oval, with scaly foliations, the upper valve less and flattened, the inner margin very entire.

Ostreum vulgare, *List.* An. Ang. 176.—Conch. t. cxciii.—*Linn.* Syst. i. 11148.—Gregarious on a hard bottom.

This shell varies much in size and shape, according to its locality. Oysters are in season from September to April, during which period they are procured by dredging, and eaten either in a raw or pickled state, or placed in artificial ponds, and *fattened.* They spawn in May, and the detached eggs, like candle-drops, adhere to stones or other objects. Although oysters abound in many parts of the coast, there are other places, especially among the Hebrides, where the formation of productive beds could be easily executed to advantage.

388. O. *parasitica.*—Shell oblong, nearly smooth, the upper valve convex.

Turt. Biv. Brit. 205. t. xvii. f. 6, 7.—Attached to different marine substances.

Length seldom reaching two inches; colour greenish, with longitudinal brownish bands. In some cases, the upper valve is semicylindrically tumid, and the under valve concave underneath, as if it had accommodated its shape to a piece of stick of the size of the fore finger, with the beaks much incurved on one side, and not extending beyond the margin.

The *Ostrea Crista-Galli*, distinguished from our other recent species by its triangular plaits, is sometimes found adhering to the bottom of foreign vessels.—*Turt.* Br. Brit. 204.

EXTINCT SPECIES.

* *Valves not plaited.*

1. O. *gigantea.*—Depressed, longer than wide, pit of the hinge large, tripartite, placed upon a straight perpendicular eminence, its sides flat, striated; sides near the edge obscurely crenulated; muscular impressions deep.—*Brand.* Foss. f. 88. *Sower.* Min. Conch.—*London Clay.*

2. O. *acuminata.*—Depressed, very long, curved, with large subimbricated transverse waves beneath; beaks and front acuminated.—*Sower.* Min. Conch. t. cxxxv. f. 2, 3.—*Lower Oolite.*

3. O. *canaliculata.*—Depressed, very long, curved, two eared, a descending sinus or two in the anterior margin, near the front; sides nearly parallel.—*Sower.* Min. Conch. t. cxxxv. f. 1.—In *Chalk.*

4. O. *deltoidea.*—Equivalved, flat, thin, orbicular, with a sinus on one side, and a produced straight beak.—*Sower.* Min. Conch. t. cxlviii.—*Upper Oolite.*

5. O. *expansa.*—Broad, deltoid, angles obtuse; hinge-pit wide, flat, slightly elevated, and nearly straight; cicatrix broad, with a sinus at the back.—*Sower.* Min. Conch. t. ccxxxviii. f. 1.—*Upper Oolite.*

6. O. *undulata.*—Recurved, subtriangular, deep, posteriorly rounded; surface radiated; laminæ imbricated, undulated; cicatrix elongated, ovate, oblique; hinge-pit slightly elevated.—*Sower.* Min. Conch. t. ccxxxviii. f. 2.—*Plastic Clay.*

7. O *Meadii.*—Tongue-shaped, thick, elongated, attached valve very concave, longitudinally undulated; the other plain and flat.—*Sower.* Min. Conch. t. cclii. f. 1, 4.—In *Oolite.*

8. O. *tener.*—Depressed, elongated, thin, nearly plain; attached valves nearly flat, with a canaliculated beak.—*Sower.* Min. Conch. t. cclii. f. 2, 3.—*Plastic Clay.*

9. O. *pulchra.*—Orbicular, depressed; one valve nearly flat, with a short incurved beak; the other valve convex, with numerous radiating undulations; beak short; hinge line straight; laminæ thin, close pressed.—*Sower.* Min. Conch. t. cclxxix.—*Plastic Clay.*

10. O. *bellovacina.*—Thick, oblong, wedge-shaped, front rounded; lower valve convex, composed of undulating laminæ, the other flat and plain, *Sower.* Min. Conch. t. ccclxxxviii. f. 1, 2.—*Plastic Clay.*

11. O. *edulina.*—Suborbicular or obovate; lower valve rather concave, composed of undulating laminæ; the other smooth and flat; beak pointed, curved.—*Sower.* Min. Conch. t. ccclxxxviii. f. 3, 4.—In *Plastic Clay.*

12. O. *læviuscula.*—Depressed, rounded, triangular; surface obscurely imbricated, smooth; beak acute; scales distinct.—*Sower.* Min. Conch. t. ccccIxxxviii. f. 1.—In *Lias.*

13. O. *obscura.*—Oblong, uneven, small; lower valve very deep, the other flat; beak curved.—*Sower.* Min. Conch. ccccIxxxviii. f. 2.—In *Oolite.*

14. O. *dorsata.*—Convex, subimbricated; upper valve marked with numerous longitudinal branched striæ; inner margin toothed.—*Sower.* Min. Conch. t. ccccIxxxix. f. 1, 2.—*London Clay.*

15. O. *semiplana.*—Oval, depressed, largely undulated; in the middle flat; attachment small. Ostrea, *Mant.* Suss. 207. t. xxv. f. 4.—*Sower.* Min. Conch. t. ccccIxxxix. f. 3.—In *Chalk.*

16. O. *vesicularis.*—Subglobose, oblique, smooth, thin; beak largely truncated; upper valve immersed, concave.—*Cuv.* Oss. Foss. ii. t. iii. f. 5.—Gryphæa globosa.—*Sower.* Min. Conch. t. cccxcii.

** *Valves plaited.*

17. O. *Marshii.*—Oblique, both valves deeply plaited in seven or eight angular diverging undulations; edge thick, flatted.—*Sower.* Min. Conch. t. xlviii. —*Lower Oolite.*

18. O. *gregaria.*—Clustered, oblong, curved, plaited; plaits many, rugged, diverging from a longitudinal plait or sulcus; valves unequally convex; beaks produced and curved.—*Sower.* t. cxl. f. 1, 3.—*Lower Oolite.*

19. O. *palmetta.*—Ovate, roundish, obscurely one-eared, depressed, with a plaited margin; plaits diverging from a longitudinal space; beaks straight.—*Sower.* Min. Conch. t. cxl. f. 2.—*Lower Oolite.*

20. O. *flabellula.*—Oblong, arched; larger valve deep, longitudinally striated, with a toothed margin; the other flat and imbricated, with an entire margin. (Chama plicata, *Brand.* Foss. f. 84, 85.) *Sower.* Min. Conch. t. cclv. —In *London Clay.*

21. O. *carinata.*—Elongated, pointed at both ends, arched; sides flattened; middle longitudinally cariniformed; plaits numerous, angular and regular; ears two, variable.—Mytilus Crista Galli, *White*, Selb. i. 12. O. car. *Sower.* Min. Conch. t. ccclxv.—In *Green Sand.*

22. O. *solitaria.*—Obovate; one valve flattish; plaits deep, sharp, rugged, and branched; beaks short.—*Sower.* Min. Conch. t. cccclxviii. f. 1.—Found near Weymouth.

23. O. *macroptera.*—Falciform depressed, with a large rectangular ear or wing within the curve; margin deeply toothed; one valve attached by a great part of its surface. *Sower.* Min. Conch. t. cccclxviii. f. 2, 3.—*Iron Sand.*

24. O. *costata.*—Orbicular; lower valve deep, ribbed; ribs numerous, branched; upper valve flat, with an undulated margin.—*Sower.* Min. Conch. t. cccclxviii. f. 3.—In *Oolite.*

GEN. DIANCHORA.—Inequivalved; the attached valve having an opening in place of a beak; the other beaked and eared.

1. D. *striata.*—Oblique, ovate, triangular; beak prominent; free valve obscurely ribbed.—*Sower.* Min. Conch. t. lxxx. f. 1.—In *Green Sand.*

2. D. *lata.*—Semicircular; beak rising; free valve plain.—*Sower.* Min. Conch. t. lxxx. f. 2.—*Mant.* Suss. 205. t. xxvi. f. 21.—Podopsis striata, *Cuv.* Oss. Foss. ii. 319. t. v. f. 2.—In *Chalk.*

3. D. *obliqua.*—Obliquely obovate; upper valve convex, marked with numerous diverging striæ; margin serrated.—*Mant.* Suss. 206. t. xxv. f. 1. t. xxvi. f. 12.—In *Chalk.*

GEN. XCVII. ANOMIA.—Inequivalve, irregular; under valve with a notch or perforation near the beak, for the passage of the tendon, by which the shell adheres to foreign bodies; ligament internal, placed transversely under the beak.

389. A. *electrica.*—Shell somewhat orbicular, with the surface a little undulate, transparent, and amber colour.

Ostrea sylvestris, *List.* Conch. t. ccv.—A. elect. *Linn.* Syst. i. 1151. *Turt.* Biv. Brit. 227. t. xvii. f. 8, 9.—West coast of Ireland, *Dr Turton.*

About an inch and a quarter in diameter; colour bright transparent yellow inside and out; surface irregular, but not rough, plaited or scaly; beak pointed, not quite terminal; the under valve flat, and scale-like, with a large interrupted perforation.

390. A. *ephippium.* — Shell orbicular-oval, rather rough, wrinkled and plaited at the margin, and partly within.

Ostreum parvum, *List.* An. Ang. 181. Conch. t. 204. An. Eph. *Linn.* Syst. i. 1150. *Mont.* Test. Brit. 155. *Turt.* Biv. Brit. 227. t. xviii. f. 1, 3.—On rocky coasts, common.

Sometimes three inches in diameter, more or less pearly, and tinged with green; surface more or less ribbed longitudinally, and becoming scaly with age; operculum oval, large, thick, rough.

391. A. *cepa.*—Shell oboval, flattish, rough; rosy-red within, but not pearly.

Linn. Syst. i. 1151. *Turt.* Biv. Brit. 228. t. xviii. f. 4.—Rocks at low spring-tides in Torbay, *Dr Turton.*

Length 2, breadth 1½ inches, oblong, inclining to oval, rather flat, with a rough but not an undulating surface; beaks terminal; the under valve thin but not scaly.

392. A. *squamula.*—Shell somewhat orbicular, smooth, transparent, and horn-coloured.

Linn. Syst. i. 1151. *Mont.* Test. Brit. clvi. and DLXXXI. *Turt.* Biv. Brit. ccxxix. t. xviii. f. 5, 6, 7.—On stones, shells, and sea-weeds.

Diameter about half an inch; flat, or a little tumid about the beaks, and smooth. The substance is always thin and brittle; the plug of attachment is tendinous, seldom hard at the base, with a testaceous termination.

393. A. *undulata.*—Shell rounded, or oblong, with longitudinal rounded striæ, and a triangular cavity on the under valve, beneath the hinge.

Ostrea subviridis, *List.* Conch. t. ccii.—O. striata, *Mont.* Test. Brit. cliii. and DLXXX.—An. und. ib. 157. *Turt.* Brit. ccxxx. t. xviii. f. 8, 9, 10. —On old shells and the crevices of rocks.

Diameter upwards of an inch; variable in figure and consistence; margin crenate, inside iridescent; on one side of the perforation in the under valve, is a triangular striated cavity; the plug terminates in a thin oval layer, strongly striate transversely, and crossed with fine longitudinal lines.

394. A. *punctata.*—Shell orbicular, with raised dots on the upper valve, and concave ones on the under valve.

Turt. Biv. Brit. ccxxxi. t. 18. f. 11.—On crabs and shells, on the south coasts of England.

Diameter about half an inch, thin, transparent, purplish white; a little truncate at the base; beaks terminal.

395. A. *cylindrica.*—Shell oval, somewhat cylindrically convex, and transversely rugged, with the beak curved backwards.

Turt. Linn. iv. 288.—A. cymbiformis, *Maton* and *Rackett*, Linn. Trans. viii. 104. t. iii. f. 6. *Mont.* Test. Brit. Sup. 64.—A. cylin. *Turt.* Biv. Brit. 232.—On fuci and sertulariæ.

Length about half an inch, breadth a quarter, narrower towards the beak, which curves over the under valve, and ends in an obtuse point; sometimes smooth, but usually with some rough transverse marks, but no longitudinal ones.

396. A. *striolata.*—Shell oval, somewhat cylindrically convex, and striate longitudinally, with the beak curved backwards.

Turt. Biv. Brit. 233.—Roots of fuci.

Resembles the last, but is marked with fine, rather remote, longitudinal raised lines.

397. A. *aculeata.*—Shell orbicular, with numerous longitudinal prickly striæ.

Mont. Test. Brit. 157. t. iv. f. 5. *Turt.* Biv. Brit. 233.—On fuci and among rocks.

Diameter about half an inch; depressed, whitish prickles; rounded above, concave, and somewhat concentrically disposed by the lines of growth; under valve wrinkled concentrically; seldom prickly.

398. A. *fornicata.* — Shell somewhat orbicular, and finely striate, the upper valve furnished with a vaulted chamber on the inside, under the beak.

Lamk. Syst. vi. 228. *Turt.* Biv. Brit. 234. t. xviii. f. 12, 13.—From Torbay, *Dr Turton.*

Diameter about half an inch; flat, white, margin sinuous; longitudinal striæ towards the margin, and fine regular transverse ones towards the pointed beak; inside silvery; under the hinge is a large vaulted chamber, which, on one side, is much curved, and scaly on the outside; perforation of the under valve round, and nearly closed.

399. A. *tubularis.*—“ Shell orbicular, with the perforation of the under valve entire, and forming a cylindrical tube.”

Turt. Biv. Brit. ccxxxiv.—On fuci.

Shell about a quarter of an inch in diameter; whitish, with the beak terminal; the under valve has the perforation entire all round, and produced into a raised cylindrical tube; the plug of attachment is tendinous.”

It is probable that several of the preceding shells may yet be reduced to the rank of varieties. In the mean time, we have followed the arrangement of Dr Turton.

EXTINCT SPECIES.

1. A. *lineata.*—Suborbicular, convex; when old, contracted towards the beak; longitudinally striated; perforation of the lower valve circumscribed. —*Sower.* Min. Conch. t. ccccxxv.—In *London Clay.*

GEN. SPONDYLUS.—Shell eared, beak of the under valve produced, with an exposed oblique truncation, having a longitudinal groove; hinge of two teeth, with an intermediate groove for the reception of the internal ligament.

1. S. *radula*.—Mr Parkinson refers to a shell of this species (of Lamark, from Grignon), which he suspects to have been from Worcestershire. "It is slightly eared, and the inferior valve is marked with rough longitudinal striæ. It is rough, oblique, and of an oval orbicular form. The stronger and most raised of the striæ of the lower valve have small spinous squamæ placed at about half an inch distant, these striæ being separated by from six to nine small granular striæ."

GEN. PLICATULA.—Shell destitute of ears; narrow at the base; the opposite margin rounded and plaited; beaks unequal entire; teeth two, with an intermediate pit for the subinternal cartilage.

1. P. *spinosa*.—Ovate depressed, spinose; margin entire; spines adpressed; smallest on the deep valve.—Harpax, *Park.* Org. Rem. iii. 221. t. xii. f. 14.—P. spin. *Sower.* Min. Conch. t. ccxlv.—In *Lias.*

2. P. *pectinoides*.—Oblong, ovate, curved, gibbose when old; longitudinal ridges numerous, furnished with depressed spines; free valve externally concave.—*Sower.* Min. Conch. t. ccccix. f. 1.—*Chalk Marl.*

3. P. *inflata*.—Suborbicular, gibbose, rather smooth, furnished with a few ridges and depressed spines; both valves convex. P. spinosa, *Mant.* Geol. Suss. 129. t. xxvi. f. 13, 16, 17. P. inf. *Sower.* Min. Conch. t. ccccix. f. 2.—*Chalk Marl.*

ARCADÆ.

GEN. XCVIII. ARCA.—Shell transverse; beaks remote; teeth numerous, enlarging from the middle, but without lateral teeth; ligament external.

400. A. *Noæ*.—Shell oblong, decussated in a punctured manner, angular at the anterior side, with the upper margin transversely elongated, sinuous and open.

Musculus striatus, *List.* Conch. t. ccclxviii. *Borl.* Corn. cclxxvii. t. 28. f. 16.—A. Noæ, *Linn.* Syst. i. 1140.—A. tortuosa, *Penn.* Brit. Zool. iv. 97.—A. Noæ, *Don.* Brit. Shells, t. clviii. f. 1, 2. *Mont.* Test. Brit. 139. *Turt.* Biv. Brit. 166.—Western coast of England and Guernsea, rare.

Shell about half an inch long, a little more in breadth; rufous, with dark zigzag bands, rounded at the longest end, angular at the other, to which the incurved beaks approximate.

401. A. *fusca*.—Shell oblong, decussated, angular at the ante-

rior side, with the upper margin shorter, straight, and nearly closed.

Balanus Bellonii, *List.* Conch. t. ccvii.—Musculus striatus, *Borl.* Corn. 277. t. xxviii. f. 15.—Arca Noæ var. *Don.* Brit. Shells, t. clviii. f. 3. A. fusca, *Mont.* Test. Brit. Sup. 51. t. 4. f. 3. *Turt.* Biv. Brit. 167.—Southern coasts of England, and Frith of Forth, rare.

This species nearly resembles the last, of which it is perhaps only a variety. It differs, however, in being narrower, the beaks more lateral, a greater convexity, straighter margin, and finer decussations.

402. A. *tetragona.*—Shell rhombic, with granular decussations, and an oblique longitudinal rib, open at the margin.

Lamk. Hist. vi. 37. *Turt.* Biv. Brit. 167. t. 13. f. 1.—At the Calves, west of Ireland, *Dr Turton.*

" Shell $\frac{7}{8}$ths of an inch long, and an inch broad, of an oblique square figure, tumid at the beaks, from which proceed a nearly central rib, to the angular point of the opposite margin; hinge not quite straight, in consequence of the marginal slope; colour whitish-brown, inside white, with a purple blotch at one end." *Turt.*

403. A. *barbata.*—Shell oblong, with longitudinal bearded ribs, decussated by minute striæ; the margin straight and nearly closed.

Brown, Wern. Mem. ii. 512. t. xxiv. f. 3.—A. reticulata, *Turt.* Biv. Brit. 168. Found in Loch Strangford, by *Dr Magee.*

Length half an inch, breadth one inch; shell white; cuticle chesnut; ribs about twelve, nearly equidistant and flat; inside striated longitudinally, margin finely crenulated.

404. A. *lactea.*—Shell oblong, decussated and bearded, angular at the anterior end, and slightly open at the margin.

Pectunculus exiguus, *List.* Conch. t. cccxxxv.—A. lac. *Linn.* Syst. i. 1141. —A. barbata, *Penn.* Brit. Zool. iv. 98. t. lviii. f. 59.—A. lac. *Mont.* Test. Brit. 138.—A. perforans, *Turt.* Biv. Brit. 169. t. 13. f. 2, 3.—Different parts of the coast, but not common.

Length half an inch, breadth three quarters; shell white, with a brown pilose cuticle; ribs numerous, fine, crossed by the wrinkles of growth; interstices punctured; inside white, margin plain.

◆

EXTINCT SPECIES.

1. A. *subacuta.* Gibbose; margin an obtuse scalene triangle, deeply plaited; breadth greater than the length; surface longitudinally striated.—*Sower.* Min. Conch. t. xliv. Upper fig.—In *Chalk Marl.*

2. A. *carinata.*—Very convex parallelopipedal, anterior side flattish, separated by an acute angle, truncated at nearly a right angle; posterior side rounded; surface longitudinally ribbed.—*Sower.* Min. Conch. t. xliv. Lower figure.—In *Green Sand.*

3. A. *Branderi.*—Transversely elongated, rhombic, gibbose, finely decussated; beaks distant; longitudinal striæ strongest; teeth numerous; edge internally entire.—*Sower.* Min. Conch. t. cclxxvi.—*London Clay.*

4. A. *appendiculata.*—Transversely elongated, rhombic, gibbose, decussated; beaks rather distant; two oblong appendages upon the space between the

beaks; edge toothed within.—*Sower.* Min. Conch. t. cclxxvi. f. 3.—*London Clay.*

5. A. *quadrisulcata.*—Twice as wide as long, convex, longitudinally striated; anterior side truncated, defined by a keel, and marked by four deep furrows; posterior side small, rounded; marginal sinus large.—*Sower.* Min. Conch. t. ccccl xxiii. f. 1.—In *Oolite.*

6. A. *pulchra.*—Transversely ovate-elongated, depressed, finely striated; anterior side rather impressed, obliquely truncated; beaks close.—*Sower.* Min. Conch. t. ccccl xxiii. f. 3.—In *Oolite.*

7. A. *duplicata.*—Transversely ovate-elongated, convex, longitudinally ribbed; ribs sulcated along the middle; margin toothed; beaks close.—*Sower.* Min. Conch. t. cccclxxiv. f. 1.—In *London Clay.*

8. A. *depressa.*—Elongated transversely, depressed, marked with elevated and crenulated striæ; extremities rounded; marginal sinus obscure.—*Sower.* Min. Conch. t. cccclxxiv. f. 2.—In *Plastic Clay.*

9. A. *tumida.*—Transversely elongated, gibbose, costated? Anterior side pointed; marginal sinus short, deep; beaks distant.—*Sower.* Min. Conch. t. cccclxxiv. f. 3.—In *Magnesian Limestone.*

10. A. *cancellata.*—Twice as wide as long, convex, longitudinally and transversely sulcated; anterior side defined by a keel, truncated; posterior side rounded; marginal sinus short, but deep; beaks nearly close.—*Mart.* Derb. t. xliv. f. 7.—*Sower.* Min. Conch. t. cccclxxiii. f. 2.—*Carboniferous Limestone.*

11. A. *rostrata.*—“ Valves equal, scaleniform; one end of the shell lengthened into a straight, smooth, conical rostrum; the other end short, gibbous, and marked from the beaks to the margin with very neat equal and acute striæ; the margin in this part of the shell crenulated; the beaks are small, pointed, and approximate, placed over the shorter extremity.”—*Mart.* Derb. t. xliv. f. 6.—In *Carboniferous Limestone.*

GEN. CUCULÆA.—Shell subtransverse, ventricose; hinge with numerous small teeth, with from two to five parallel plates; ligament subexternal; anterior muscular impression with an elevated margin.

1. C. *glabra.*—Rhomboidal, anterior angle obtuse, posterior edge of the front rounded; surface covered by fine longitudinal lines, decussated by the lines of growth; teeth of the hinge deeply striated.—*Park.* Org. Rem. iii. 171. *Sower.* Min. Conch. t. lxvii.—*Green Sand.*

2. C. *decussata.*—Transversely ovate; gibbose, with flattish longitudinal ridges; anterior side angular; lines beneath the cartilage few.—*Park.* Org. Rem. iii. 171. *Sower.* Min. Conch. t. ccvi. f. 3, 4.—*Green Sand.*

3. C. *oblonga.*—Transversely oblong, gibbose, longitudinally striated; anterior side wedge-shaped; lines beneath the cartilage numerous.—*Sower.* Min. Conch. t. ccvi. f. 1, 2.—*Inferior Oolite.*

4. C. *carinata.*—Obliquely cuneiform, smooth; anterior side pointed, and distinguished by a ridge running up the beak.—*Sower.* Min. Conch. t. ccvii. f. 1.—In *Green Sand.*

5. C. *fibrosa.*—Obovate, gibbose, with numerous longitudinal elevated striæ

upon the surface; anterior margin straight, prominent near the hinge.—*Sower.* Min. Conch. t. ccvii. f. 2.—In *Green Sand.*

6. C. *elongata.*—Elongated, subcylindrical, finely striated; anteriorly pointed; posterior side very short.—*Sower.* Min. Conch. t. cccclxvii. f. 1.—*Inferior Oolite.*

7. C. *costellata.*—Transversely oblong, gibbose, longitudinally striated; anterior lobe wing-shaped, ribbed; posterior side rounded, ribbed; beaks incurved, distant from each other.—*Sower.* Min. Conch. t. cccclxvii. f. 2.—*Green Sand.*

8. C. *minuta.*—Elongated-ovate, convex, striated, anteriorly submucronated; anterior lobe small, separated by a keel; beaks nearly close.—*Sower.* Min. Conch. t. cccclxvii. f. 3.—*Oolite.*

9. C. *rudis.*—Transversely oblong, convex, rugged, and longitudinally ribbed; beaks incurved, nearly close together; anterior lobe not defined.—*Sower.* Min. Conch. t. cccclxvii. f. 4.—*Oolite.*

GEN. XCIX. PECTUNCULUS.—Shell orbicular, subequilateral; hinge line semicircular, the teeth in the middle obsolete; ligament external.

405. P. *pilosus.*—Shell tumid, nearly equilateral, with numerous longitudinal striæ and transverse lines of growth.

P. ingens, *List.* Conch. t. ccxlvii. f. 82.—Arca pilosa, *Linn.* Syst. i. 1143. Arca Glycymeris, *Penn.* Brit. Zool. iv. 98, t. lvii. f. 58.—A. pilosa, *Mont.* Test. Brit. 137.—Pect. Glycymeris, pilosus, and undatus, *Turt.* Biv. Brit. 171.—Inhabits deep water.

Diameter upwards of 2 inches, covered with a thick, brown, pilose cuticle, underneath which the shell is whitish, with brown interrupted stripes, either transverse or longitudinal; beaks tumid, and slightly recurved; inner margin notched.—This species differs from the *P. glycymeris* of Lamark in the absence of the longitudinal ribs, with their intermediate striæ.

406. P. *decussatus.*—" Shell orbicular, flat, decussate, with clouded coloured marks."

Turt. Biv. Brit. 173, t. xii. f. 5.—British Channel.

" Shell an inch in diameter, quite orbicular, flattish, with numerous fine raised decussate lines, which are clothed with a silky brown pile; colour yellowish-white, with purple and crimson clouded patches, which are often disposed in zigzag angles, giving the shell a beautifully marked appearance: inside glossy white, with frequently a dark red blotch near the centre; the margin very strongly serrate."—*Turton.*

407. P. *nummarius.*—" Shell lenticular, with the beaks permanent, covered with numerous rounded red dots."

P. exiguus, *List.* Conch. t. ccxxxix. f. 81. *Turt.* Biv. Brit. 174. t. xii. f. 6.—Torbay and British Channel.

" Shell about half an inch in diameter, rather convex, very finely decussate, yellowish white, or cream colour, with numerous round red dots, which very rarely become confluent about the margin, and form short lines; beaks tumid and prominent, causing the margin on each side of them to appear a little projecting, or, as it were, slightly eared like a pecten."—*Turton.*

EXTINCT SPECIES.

1. P. *decussatus*.—Transversely obovate; sides rather straight; surface covered with numerous longitudinal striæ; hinge teeth 25 to 30; margin thick, plain.—*Sower.* Min. Conch. t. xxvii. f. 1.—*London Clay.*

2. *costatus*.—Orbicular, depressed, with 25 longitudinal sharp ridges, and a few transverse striæ; hinge of 14 teeth; margin serrated within.—(*Arca deleta* of Brander. *Sower.* Min. Conch. t. xxvii. f. 2.—*London Clay.*

3. P. *Plumstediensis*.—Transversely obovate, slightly oblique, with longitudinal obscure furrows, and minute transverse striæ; margin serrated within.—*Sower.* Min. Conch. t. xxvii. f. 3.—*Plastic Clay.*

4. P. *variabilis*.—Obliquely suborbicular, rather convex, finely striated longitudinally, becoming smooth or sulcated by wear; teeth of the hinge and lines upon the area of the ligament, numerous; beaks short, nearly close. —*Sower.* Min. Conch. t. cccclxxi. f. 1.—In *Crag.*—It is probable that this shell is merely the *Pectunculus pilosus*, found in modern *marine diluvium*, instead of a species connected with the anterior epoch.

5. P. *brevirostris*.—Transversely obovate, rather oblique, and inequilateral, convex, obscurely costated, concentrically striated; hinge line rather straight; beaks short, not oblique; hinge teeth few.—*Sower.* Min. Conch. t. cccclxxii. f. 1.—*London Clay.*

6. P. *scalaris*.—Obovate, convex, longitudinally ribbed, ribs narrow, sharp, area of the ligament short, projecting at the extremities, with a triangular pit in its centre; margin irregularly toothed.—*Sower.* Min. Conch. t. clxxii. f. 2.—*London Clay.*

7. P. *sublævis*.—Transversely obovate, equilateral, rather gibbose, with many slightly elevated ribs; beaks short, nearly close; sides smooth.—*Sower.* Min. Conch. t. cccclxxii. f. 2.—In *Green Sand.*

8. P. *umbonatus*.—Orbicular, gibbose, nearly equilateral, longitudinally striated and obscurely costated; beaks prominent, obliquely curved, a lobe on the anterior side.—Cardium umbonatum, *Sower.* Min. Conch. t. clvi. f. 2, 3, 4, and P. umb. *ib.* t. cccclxxii. f. 3.—In *Green Sand.*

9. P. *minimus*.—Orbicular, convex, smooth; hinge line straight, prominent at the extremities; margin not toothed.—*Sower.* Min. Conch. t. cccclxxii. f. 5.—In *Oolite.*

10. P. *oblongus*.—Transversely oblong, inequilateral, rather convex, smooth; sides obliquely truncated; margin not toothed.—*Sower.* Min. Conch. t. cccclxxi. f. 6.—In *Oolite.*

GEN. C. NUCULA.—Shell inequilateral, beaks approximate; hinge line bent in the middle, with a spoon-shaped projecting tooth at the angle, and numerous lateral sharp-pointed teeth; ligament internal.

* *Margin crenulated.*

408. N. *nuclea*.—Shell subtriangular; beak near the short end with an oval impression beneath.

Arca nucleus, *Linn.* Syst. i. 1143. *Penn.* Brit. Zool. iv. 98. *Mont.* Test. Brit. 141.—N. nucleus, *Turt.* Biv. Brit. 176, t. xiii. f. 4.—Not uncommon.

Length about half an inch, breadth a little more; cuticle olive-green, with yellow rays; faintly streaked longitudinally with numerous fine lines of growth.

** *Margin plain.*

409. N. *minuta.*—Shell oval, transversely striated, with the anterior side produced, curved, and truncated.

Arca oblonga, striata, antice angulata, *Walk.* Test. Min. ii. t. cxi. f. 81. —A. caudata, *Don.* Brit. Shells, t. lxxviii.—A. min. *Mont.* Test. Brit. 140.—N. min. *Turt.* Biv. Brit. 178.—In deep water, not common.

Length $\frac{3}{8}$ths, breadth $\frac{4}{8}$ths of an inch; colour white; three or four strong concentric ridges; beak very small, turning a little towards the angulated side, beneath which is a smooth depression reaching to the end.

410. N. *rostrata.*—Shell oval, transversely striated, anterior side produced, curved, and slightly ribbed longitudinally.

Arca rostrata, *Mont.* Test. Brit. Sup. 55, t. xxvii. f. 7.—N. ros. *Turt.* Biv. Brit. 178.—In the Frith of Forth, *Mr Laskey.*

Length half an inch, breadth three quarters; glossy, and of a horn colour; striæ fine, regular, and reflected; from the beaks to the produced extremity the striæ are irregular in crossing the longitudinal ribs; inside polished.—In this and the preceding species the central tooth is obsolete.

411. N. *tenuis.*—Shell obliquely heart-shaped and smooth.

Arca ten. *Mont.* Test. Brit. Sup. 56, t. xxix. f. 1.—N. ten. *Turt.* Biv. Brit. 177.—In the Frith of Forth, *Mr Laskey.*

Length scarcely a quarter of an inch; white, with an olivaceous cuticle; beaks small, slightly inflected; hinge with six teeth on one side of the central tooth, and nine on the other; margin thin.

EXTINCT SPECIES.

1. N. *Cobbaldiæ.*—Transversely obovate, convex; surface marked with zigzag furrows, diverging over the sides; edge entire.—*Sower.* Min. Conch. t. clxxx. f. 2.—In *Crag.*

2. N. *lanceolata.*—Transversely ovato-lanceolate, smooth; posterior side pointed, edge entire; a concave deltoid space in the hinge.—*Sower.* Min. Conch. t. clxxx. f. 1.—In *Crag.*

3. N. *lævigata.*—Transversely elliptical, convex, smooth; posterior side pointed, edge entire, truncated.—*Sower.* Min. Conch. t. cxcii. f. 1, 2.—In *Crag.*

4. N. *similis.*—Transversely obovate, depressed, obscurely striated longitudinally; posterior side straight; lunette imbedded; concave in the middle oblong, edge crenulated.—(*Arca nucleus*, Brander, 40. f. 101.) *Sower.* Min. Conch. t. cxcii. f. 3, 4, 10.—*London Clay.*

5. N. *trigona.*—Ovato-deltoid, compressed, smooth, edge crenulated, hinge pit short; lunette concave.—*Sower.* Min. Conch. t. cxcii. f. 5.—*London Clay.*

6. N. *minima.*—Transversely ovate, convex, transversely striated; posterior side acuminated; edge entire; lunette defined, elongated.—*Sower.* Min. Conch. t. cxcii. f. 8, 9.—*London Clay.*

7. N. *pectinata.*—Transversely elliptical, elongated, convex; posterior side truncated; longitudinally furrowed; lunette imbedded, flat, cordate; edge crenulated.—*Sower.* Min. Conch. t. cxcii. f. 6, 7.—*Chalk Marl.*

8. N. *ovata.*—Transversely ovate, rather depressed, obscurely striated transversely; lunette slightly impressed, cordate, elongated; margin entire." —*Mant.* Suss. 94. t. xix. f. 26, 27.—In *Blue Chalk Marl.*

9. N. *variabilis.*—Transversely oval elongated, sometimes oblique, rather depressed, smooth; beaks near one end.—*Sower.* Min. Conch. t. cccclxxv. f. 2.—In *Oolite.*

10. N. *lachryma.*—Ovate, gibbose, smooth; anterior side produced, pointed, convex above; posterior side rounded.—*Sower.* Min. Conch. t. cccclxxvi. f. 3.—In *Oolite.*

11. N. *mucronata.*—Subrhomboidal, rounded, convex, concentrically sulcated, anteriorly mucronated.—*Sower.* Min. Conch. t. cccclxxvi. f. 4.—In *Oolite.*

12. N. *angulata.*—Rhomboidal, concentrically striated; most convex near the beaks; front rounded.—*Sower.* Min. Conch. t. cccclxxvi. f. 5.—In *Green Sand.*

13. N. *impressa.*—Transversely oval, depressed, smooth; beaks near one extremity; lunette deeply sunk, convex, elongated; edges entire.—*Sower.* Min. Conch. t. cccclxxv. f. 3.—*Green Sand.*

14. N. *antiquata.*—Triangular, rounded, gibbose, antiquated, longitudinally striated; lunette heart-shaped, sunk; margin toothed.—*Sower.* Min. Conch. t. cccclxxv. f. 4.—*Green Sand.*

15. N. *ovum.*—Transversely obovate, ventricose, smooth, anteriorly pointed.—*Sower.* Min. Conch. t. cccclxxvi. f. 1.—*Lias.*

16. N. *ventricosa.*—Concentrically sulcated; anterior side rounded; posterior much produced, attenuated; upon the posterior slope is a broad concave area, bounded by two ridges that run from the beak to the extremity; sulci fine.—*Sower.* Min. Conch. t. cccclxxvi. f. 2.—In *Oolite?* Northamptonshire.

17. N. *deltoidea.*—Triangular, inflated; posterior side obliquely truncated, flat, pointed; anterior side short, rounded.—*Sower.* Min. Conch. t. dliv. f. 1. —*Upper Marine Formation*, Isle of Wight.

18. N. *inflata.*—Nearly globular, smooth; the posterior side produced, compressed, pointed.—*Sower.* Min. Conch. t. dlv. f. 1.—*London Clay.*

19. N. *undulata.*—Globular, concentrically undulated; posterior side produced, contracted, pointed.—*Sower.* Min. Conch. t. dliv. f. 3.—*Chalk Marl.*

20. N. *amygdaloides.*—Transversely elliptical, elongated and sulcated, compressed; sides equal.--*Sower.* Min. Conch. t. dliv. f. 4.—*London Clay.*

21. N. *palmæ.*—Transversely elongated, very convex, shining; extremities rounded, equal; beaks nearly central.—*Sower.* Min. Conch. t. cccclxxv. f. 1.—*Carboniferous Limestone.*

22. N. *attenuata.*—Transversely elongated, ventricose; one end short rounded; the other produced, with a broad concave area, elevated in the middle along the joint; the whole covered with regular fine concentric ribs, or striæ. Like the last in form.—Multarticulate Cockle, *Ure*, Ruth 310, t. xv. f. 5.—In slate-clay of the *Independent Coal Formation.*

23. N. *gibbosa.*—Transversely ovate, ventricose, beaks incurved near one end, the other slightly produced and obtuse; obsoletely furrowed concentrically, with irregular distant grooves.—Multarticulate Cockle, *Ure*, Ruth. 310, t. xv. f. 6.—In *Slate-clay* of the Independent Coal Formation.

TRIGONIADÆ.

GEN. TRIGONIA.—Equivalve, unequilateral trigonal; on the right valve are two oblong, flat, diverging hinge teeth, transversely grooved on each side; on the left valve four flat hinge teeth, transversely grooved on one side only, disposed in pairs; ligament external, marginal.

1. T. *costata*.—Triangular, with transverse, smooth ribs; anterior side marked with many small, and three large, prominent, longitudinal, crenulated ridges.—Curvirostra rugosa, *Luid.* Lith. 36, t. ix. f. 714.—T. cost. *Park.* Org. Rem. iii. 175, t. xii. f. 4.—*Sower.* Min. Conch. t. lxxxv.—*Inferior Oolite.*

2. T. *spinosa*.—Roundish, depressed, many ribbed; anterior side truncated; ribs oblique, diverging both ways from the ridge that separates the anterior side; set with short spines.—*Park.* Org. Rem. iii. 177. t. xii. f. 7.—*Sower.* Min. Conch. t. lxxxvi.—In *Green Sand.*

3. T. *clavellata*.—Triangular, rather wider than long, with ten or more oblique rows of tubercles; anterior side straight, with three longitudinal knotted ridges.—*Luid.* Lith. 36, t. ix. f. 107. *Park.* Org. Rem. iii. 175. t. xii. f. 3. *Sower.* Min. Conch. t. lxxxvii.—*Oolitic Series.*

4. T. *dædalea*.—Obtusely rhomboidal, with many oblique rows of tubercles; anterior side angular, with many scattered tubercles, and one longitudinal row bounded by a longitudinal ridge, on which is another row of large tubercles.—*Park.* Org. Rem. iii. 176, t. xii. f. 6. *Sower.* Min. Conch. t. lxxxviii. —*Green Sand.*

5. T. *eccentrica*.—Transversely ovate, convex; anterior side produced. posterior side round, with oblique undulating ridges on the surface.—*Park.* Org. Rem. iii. 175, t. xii. f. 5.—*Sower.* Min. Conch. t. ccviii. f. 1, 2.—In *Green Sand.*

6. T. *affinis*.—Transverse, oval, gibbose, half covered by transverse ridges. —*Sower.* Min. Conch. t. ccviii. f. 3.—*Green Sand.*

7. T. *aliformis*.—Wing-formed; anterior side produced, truncated, with a broad compressed ridge extended to the beak; posterior side costated, rounded; costæ many, thick, irregularly crenulated, oblique, recurved, and attenuated towards the ridge on the anterior side, where they terminate.—*Park.* Org. Rem. iii. 176, t. xii. f. 9. *Sower.* Min. Conch. t. ccxv.—In *Green Sand.*

8. T. *gibbosa*.—Transversely oblong, gibbose, slightly arched, concentrically undulated, or irregularly sulcated; anterior side separated by a broad longitudinal furrow or plane space.—*Sower.* Min. Conch. t. ccxxxv. ccxxxvi. —*Upper Oolite.*

9. T. *striata*.—Obtusely triangular, convex; with arched, oblique, crenulated costæ upon the middle and posterior side; anterior side nearly covered by numerous, elevated, sharp ridges.—*Sower.* Min. Conch. t. ccxxxvii. f. 1, 2, 3.—*Inferior Oolite.*

10. T. *duplicata*.—Transversely oblong; anterior side marked with small undulating ridges, and bounded by a strong tuberculated ridge; over the middle are longitudinal crenulated costæ, suddenly reflected over the posterior side; on the front are short intermediate ridges.—*Sower.* Min. Conch. t. ccxxxvii. f. 4, 5.—*Inferior Oolite.*

11. T. *pennata.*—Oblong, transverse, with concentric costæ; along the middle of the anterior side is a ridge from which many tuberculated ridges diverge each way.—*Sower.* Min. Conch. t. ccxxxvii. f. 6.—In *Green Sand.*

12. T. *elongata.*—Elongated, gibbose, subtriangular; anterior side obtuse, transversely costated; posterior side separated from the anterior by a crenulated carina, bicarinated, longitudinally striated, striæ granulated.—*Sower.* Min. Conch. t. ccccxxxi.—*Upper Oolite.*

13. T. *nodosa.*—Obovate, depressed; anterior part covered with rows of large knobs, a portion of the posterior part plain; superior edge straight.—*Sower.* Min. Conch. t. DVII. f. 1.—In *Green Sand.*

14. T. *imbricata.*—Transversely oblong, depressed; with five or six concentric dentated, subimbricated keels upon the rounded anterior side; posterior side obliquely truncated, ribbed.—*Sower.* Min. Conch. t. DVII. f. 2, 3. —*Oolite.*

15. T. *cuspidata.*—Obovate, depressed, ribbed; posterior side truncated, its lower angle pointed; ribs concentric, with projecting angles where they pass into the posterior side.—*Sower.* Min. Conch. t. DVII.—*Oolite.*

16. T. *angulata.*—Transversely elongated, convex; posterior side produced, truncated, transversely striated, bounded by a crenulated line; the remainder ornamented with nodose ridges, bent at right angles as they pass over the middle.—*Sower.* Min. Conch. t. DVIII. f. 1.—*Under Oolite.*

17. T. *pullus.*—Obovato-triangular, with transverse smooth ribs; posterior side obliquely truncated, marked with several crenulated ridges, and bounded by a strong crenulated keel; lunette large, regularly striated across.—*Sower.* Min. Conch. t. DVIII. f. 2, 3.—In *Oolite.*

18. T. *spectabilis.*—Suborbicular, rather elongated, convex, nearly smooth, ornamented with about seven bent rows of large round tubercles upon the anterior side, and a few small ones scattered over the posterior side; one row of compressed tubercles upon the posterior slope.—*Sower.* Min. Conch. t. DXLIV. —In *Green Sand.*

GEN. CI. AVICULA.—Shell flat, oblique unequivalve, unequilateral; transversely produced in a straight line at the base, where the sides are lobed, and the beaks rather remote; hinge linear, with a single tooth in each valve under the beaks; ligament linear external.

412. A. *hirundo.*—With the tail as long as the wing.

Turt. Biv. Brit. 220, t. xvi. f. 3.—On the southern coasts of England and Ireland.

Length 2 inches, breadth nearly the same; smooth, or slightly scaly with the layers of growth, but, under a lens, it appears finely punctured; colour green or brown; inside pearly. It was first observed, as a native, by Miss Hutchins, in Bantry Bay; and announced as British by Mr Sowerby in his Min. Conch. i. 14.

EXTINCT SPECIES.

1. A. *media.*—Ovate, depressed; wings large unequal, one wing acute, valves nearly equal; length of the shell and hinge nearly equal; surface smooth.—*Sower.* Min. Conch. t. ii.—*London Clay.*

2. A. *echinata.*—Obovate, gibbose, many muricated radii upon the deepest valve; flatter valve smooth, with the anterior ear pointed.—*Sower.* Min. Conch. t. ccxliii.—In the *Inferior Oolite.*

3. A. *costata.*—Deep valve gibbose, transversely obovate, with eight smooth costæ; ears nearly equal; shallow valve nearly flat, with many radii; anterior ear large, produced; posterior ear small.—*Sower.* Min. Conch. t. ccxliv. f. 1.—*Upper Oolite.*

4. A. *inæquivalvis.*—Oblique, elliptical, convex, with a large projecting ear, covered with radiating striæ, and many thin costæ; flatter valve convex, smooth, marked with diverging sulci, included within the deepest valve.—*Sower.* Min. Conch. t. ccxliv. f. 2.—*Middle Oolite.*

5. A. *ovata.*—Transversely ovate, convex; posterior side elongated, blunt; hinge-line long, forming part of the posterior wing, which is most distant.—*Sower.* Min. Conch. t. dxii. f. 2.—*Inferior Oolite.*

6. A. *lanceolata.*—Transversely linear; lanceolate, compressed; posterior wing large, obtuse angled; anterior wing minute, pointed. A doubtful shell. *Sower.* Min. Conch. t. dcxii. f. 1.—In *Lias.*

GEN. CII. PINNA.—Shell longitudinal, cuneiform, equivalve; pointed at the base; open at the top; ligament marginal linear, very long, and subinternal.

413. P. *ingens.* — Shell oval, triangular, with transverse arched striæ; flat at top, and straight at the hinder side.

Penn. Brit. Zool. iv. 115. *Mont.* Test. Brit. 180.—P. lævis, *Don.* Brit. Shells, t. clii.—P. ingens and fragilis, *Turt.* Biv. Brit. 222. t. xxii. f. 1. —In deep water on the southern, western, and northern shores.

Length about a foot, breadth half a foot; semi-transparent, horn-colour; compressed at the broad end, from which it runs, in front, nearly with a straight edge, for two-thirds, and then slopes suddenly to the apex; a few obsolete longitudinal ridges towards the back, and scaly wrinkles towards the front. It is, however, rather irregular in its markings and outline. When examined by a lens, the surface is finely punctured, like the Avicula hirundo. —This species appears to have been first discovered, as British, by the late Dr Walker. Montagu found it gregarious in beds, left dry at very low tides in Salcomb Bay.

414. P. *fragilis.*—Shell triangular; front margin rounded; scaly; ribs about eighteen.

Penn. Brit. Zool. iv. 114, t. lxix. f. 80.—P. muricata, *Don.* Brit. Shells, t. x.—P. pectinata, *Mont.* Test. Brit. 178. *Turt.* Biv. Brit. 223. t. xix. f. 1.—Southern coasts.

Length six inches, breadth two and a half; pellucid; corneous; the longitudinal ribs run the whole length of the shell; towards the middle, in front, the scaly striæ run obliquely to the margin.

415. P. *muricata.*—Triangular, with ten or twelve broad ribs, and intermediate smaller ones at the wide end, beset with concave prickles.

Pult. Dorset. 39.—*Mont.* Test. Brit. 183. t. v. f. 3.—*Turt.* Biv. Brit. 224. —Dredged near Weymouth.

Length 5, breadth 2 inches; corneous, brittle, glossy. On the open side the contour not rounded till near the broad extremity.

416. P. *papyracea*.—Shell oval, triangular, with nine remote unarmed ribs.

Turt. Biv. Brit. 224. t. xx. f. 3.—Coast of Devon.

Length 4½, breadth 2¼th inches; thin, brittle; the distant ribs cover nearly the whole surface; the anterior margin slightly rounded; contracted rapidly towards the apex; the open end even.

* * *

EXTINCT SPECIES.

1. P. *affinis*.—Cuneiform, ventricose, straight, longitudinally ribbed, rather thick, smooth.—*Sower.* Min. Conch. t. 313. f. 2.—*London Clay.*

2. P. *arcuata*.—Nearly equilateral, ventricose, finely ribbed, arched.—*Sower.* Min. Conch. t. 313. f. 3.—*London Clay.*

3. P. *lanceolata*.—Lanceolate, slightly curved, longitudinally striated, section quadrangular.—*Sower.* Min. Conch. t. 281.—*Inferior Oolite.*

4. P. *tetragona*.—Narrow, smooth, or obscurely ribbed, prismatic; valves longitudinally carinated with a suture in the middle.—*Sower.* Min. Conch. t. 313. f. 1.—*Green Sand* and *Oolite.*

5. P. *granulata*.—Broad, nearly equilateral, convex, obscurely decussated, with a small elevation in the centre of each division; anterior side rounded. *Sower.* Min. Conch. t. 347.—*Oolite.*

6. P. *flabelliformis*.—Somewhat fan-shaped, beaks pointed; broad end rounded; surface with narrow longitudinal ribs, and broad, shallow, smooth furrows.—*Mart.* Derb. t. vi. f. 1, 2.—*Carboniferous Limestone.*

SIPHONIDA.

I. One syphon only, formed by the union of the cloak posteriorly.

A. *Shell transverse; beaks obsolete, ligament, linear and external.*

a. Furnished with a byssus; marine. Mytilidæ.
Mytilus.
Modiolus.
Lithodomus.

aa. Destitute of a byssus; inhabiting fresh water. Unionidæ.

b. Hinge simple.
Anodon.
(Iridina.)

b b. Hinge with teeth.
Unio.
Alismadon.

A A. *Shell with prominent beaks, the ligaments internal. Carditadæ.*
Cardita.
Venericardia.
Crassatella.

II. Cloak closed anteally and retrally, with three openings towards the middle of the ventral margin, the first for the byssus, the middle one for the entrance of water, and the anal posterior one. (Tridacnadæ.)

III. Cloak open anteally, with two retral syphons, the one branchial and the other anal, which are sometimes produced into united or separate tubes. A foot and two adductor muscles.

A. *Shell heart-shaped; beaks prominent, incurved, with strong hinge-teeth; ligament external.*

a. Shell adhering, irregular, inequivalve; anterior aperture of the cloak small, corresponding with the size of the foot. Chamadæ.
Chama.
(Diceras)
(Etheria.)

a a. Shell free, regular, equivalve; foot large. Cardiadæ.
Isocardia
Hippopodium.
Cardium.
Pholadomya
(Cypricardia.)

A A. *Shape various.*
- *a.* Ligament internal.
  - *b.* Inequivalve. CORBULADÆ.
    - Corbula.
  - *b b.* Equivalve. MACTRADÆ.
    - *c.* Ligament simple.
      - *d.* Lateral teeth.
        - Mactra.
        - Goodallia.
        - Lepton.
        - Kellia.
      - *d d.* No lateral teeth.
        - Loripes.
        - Ervillia.
    - *c c.* A subsidiary external ligament.
      - Amphidesma.
- *a a.* Ligament external.
  - *b.* Two primary teeth, at most, on the same valve. (*Nymphaces* of Lamark.)
    - *c.* Ligament at the shortest side, being the posterior one abbreviated. DONACIDÆ.
      - Donax.
      - Capsa.
      - Tellina.
    - *c c.* Ligament at the longest side.
      - *d.* No lateral teeth.
        - Psammobia.
        - Astarte.
      - *d d.* Lateral teeth.
        - Lucina.
        - Myrtea.
  - *b b.* Three teeth, at least, on the same valve; the other with an equal number, or less. (*Conques* of Lamark.)
    - *c.* Marine. VENERIDÆ.
      - Cyprina.
      - Cytherea.
      - Venus.
      - Venerupis.
    - *c. c.* Fluviatile. CYCLADÆ.
      - Cyclas.
      - *Cyrena.*
      - (Galateola.)

IV. Cloak closed ventrally; the anteal opening small, and not exposing the mouth or gills, and serving as a passage for the foot; posterior openings tubular.

A. *Lodged at the extremity of a calcareous tube with which it is more or less intimately connected.* TEREDINIDÆ.
- Teredo.
- Xylophaga.
- *Fistulana.*
- *Clavagella.*

A A. *Destitute of a secreted calcareous tube.*

a. Ligament external.

- PHOLADÆ. With accessory valves, or gaping ventrally.
  - Pholas.
  - Gastrochæna.
- SOLENIDÆ. No accessory valves; gaping only at the extremities.
  - Solen
  - Sanguinolaria.
  - Hiatella.
  - Panopæa.
  - (Glycemeris)

a a. Ligament internal.

- Mya.
- Lutraria.
- Sphenia.
- Pandora.
- Galeoma.

MYTILIDÆ.

GEN. CIII. **MYTILUS.** MUSSEL.—Shell longitudinal, equivalve, beaks acute, nearly straight and terminal, with a variable number of minute teeth.

417. M. *edulis.* Common Mussel.—Beaks blunt, ventral margin towards the beaks swollen; smooth, or slightly wrinkled by the layers of growth, with longitudinal coloured bands.

Musculus subcœruleus, *List.* Conch. t. ccclxii. f. 200.—Myt. edulis, *Linn.* Syst. i. 1158.—Gregarious on hard ground, above low water-mark.

Sometimes reaching to 5 inches in length, and 2 in breadth; colour bluish-black, with dusky, yellowish, radiating lines; inside whitish, with blue margins; hinge with many teeth. When of slender growth and translucent, it has been denominated *Mytilus pellucidus;* and when, by confinement in rocks, the beaks have become incurved, with the anterior margin concave, it has then been called *M. incurvatus.* The mussel is extensively used as a bait; and is likewise sought after as an article of food, being esteemed rich and in season in autumn, but useless and even deleterious in spring.

418. M. *decussatus.*

" Shell longitudinally ovate, with the umbo at the smaller end; sides equal. It is very thin, pellucid, of a pearly white, when divested of the epidermis (which is a pale olive-brown), and is finely striated longitudinally, crossed by more minute striæ in a transverse direction, that gives it a decussated appearance when examined under a microscope. The inside is smooth, with a nacred gloss. At the hinge is a slight indenture, and the margin contiguous slightly denticulated; and near the front margin is a singular reflected transverse ridge."—*Mont.* Test. Brit. Sup. 69. A minute shell, about the eighth of an inch in length, found by Mr Laskey, at Dunbar; its place in the system uncertain.

STRAGGLERS.

1. M. *umgulatus.*—Smooth, hind margin inflected; hinge with two teeth; greenish, with transverse zig-zag markings, *List.* Conch. t. ccclx. *Don.* Brit. Shells, t. cxxviii. f. 2.—Adhering to the bottom of vessels, especially from the African coast.

2. M. *polymorphus,* Gm.—Ventral surface flattened; dorsal edge rounded; beaks obtuse and inflected; green, with dusky transverse bands. *Sower.* Zool. Journ. i. 584.—Found in the Thames, in the Commercial Docks, into which it is supposed to have been brought from the Danube with timber.

3. M. *crenatus.*—Trigonally ovate, with slightly wrinkled, longitudinal, rounded ribs. This species was brought into Portsmouth Harbour, 3d May 1816, on His Majesty's ship Wellesley, from the East Indies. A specimen now before me, taken at that time, is nearly three inches in length. It appears from a communication by Lieutenant J. H. Davies and Mr Willcox (Annals of Philosophy, Aug. 1825, 148), that it had survived since 1816, and had propagated.—These two species differ from the true Mytili in the anterior adductor muscle, being seated in a pit at the beak.

EXTINCT SPECIES.

1. M. *amplus*.—Depressed, triangular, acutely angled at the base; longitudinally striated, excepting over the posterior side; thin.—*Sower.* Min. Conch. t. vii.—In *Oolite.*

2. M. *antiquorum*.—Elongated, ovate, rather gibbose, smooth, straight; beaks obtuse, nearly close; hinge toothed.—*Sower.* Min. Conch. t. cclxxv. 1, 2, 3.—In *Crag.*

3. M. *alæformis*.—Obovate, with an acuminated beak, curved, depressed, smooth, with teeth in the hinge. *Sower.* Min. Conch. t. cclxxv. f. 4.—In *Crag.*

4. M. *pectinatus*.—Quadrangular, oblong, gibbose, longitudinally striated; slightly curved; beaks produced; front straight.—*Sower.* Min. Conch. t. cclxxxii.—*Upper Oolite.*

5. M. *edentulus*.—Elongated, smooth; disk obscurely keel-shaped; beak sharp; posterior side nearly straight; no tooth in the hinge.—*Sower.* Min. Conch. t. ccccxxxix. f. 1.—In *Green Sand.*

6. M. *lanceolatus*.—Lanceolate, slightly curved, smooth; disk keel-formed; posterior side flat; beaks acute.—*Sower.* Min. Conch. t. ccccxxxix. f. 2.—In *Green Sand.*

7. M. *sublævis*.—Oblong, triangular, rather curved; disk obscurely keel-shaped; front straightish; beaks acute; lines of growth rather prominent. *Sower.* Min. Conch. t. ccccxxxix. f. 3.—*Lower Oolite.*

8. M. *Braardii*.—Convex, straight, pear-shaped, elongated; beaks acute, terminal, (within each beak a plate is extended to the opposite edge for the support of a tendon, and within that is a flat angular process).—*Sower.* Min. Conch. t. DXXXII. f. 2.—In *Crag.*

9. M. *affinis*.—Obliquely oblong, carinated, smooth; sides parallel, straight; the posterior arched in the young shell; hinge without teeth, its anterior margin reflected.—*Sower.* Min. Conch. t. DXXXII. f. 1.—In *Crag.*

10. M. *crassus*. — Shell very thick, ventral edge nearly straight, beaks pointed. *Flem.* Edin. Phil. Journ. No. XXIV. 246, tab. ix. f. 3. Gregarious. In limestone slate-clay and clay ironstone in the *independent coal formation* in Scotland.

GEN. CIV. MODIOLA. — Shell subtransverse, equivalve; beaks nearly terminal, hinge without teeth, and the ligament external.

419. M. *vulgaris*.—Shell smooth, or slightly wrinkled, compressed and prominent at the extremity of the ligament; beaks tumid.

List. Conch. t. MLVII. f. 5. Mytilus modiolus, *Linn.* Syst. i. 1158. *Mont.* Test. Brit. 165.—On hard ground beyond low water-mark.

Length 5 or 6 inches, breadth about one-half less; rounded at both extremities; cuticle thick, yellowish-brown, sometimes with simple leaf-like filaments. In this last state, it is the *Mytilus barbatus* of Montagu. In some cases, it is distorted by the byssus, and is then the M. *umbilicatus* of Pennant. —This species is eagerly sought after, as a bait for cod.

420. M. *Gibbsii.*—Shell somewhat triangular, striated transversely, clothed with foliations, which are serrated on one edge.

(*Leach.* Zool. Misc. ii. 34. t. lxxii. f. 2.) *Turt.* Biv. Brit. 200.—West coast of England.

" Shell about two inches long, and one and a half broad; very flat and angular at the anterior side, regularly striated transversely, white and opake under the skin, covered, more or less, with long foliations, which are constantly notched down one of the sides."

421. M. *discrepans.* — Shell interruptedly longitudinally striated, beaks obsolete, cuticle black.

Mytilus discrepans, *Mont.* Test. Brit. 167. and Sup. 65. t. xxvi. f. 4.—Modiola discrepans, *Turt.* Biv. Brit. 202. Linn. Trans.—Gregarious in deep water. At Newhaven it is called Corduroy Mussel.

Sometimes reaching to two inches in length; compressed and rounded at both extremities; surface of the shell divided into three compartments by a longitudinally striated space from the beaks along the back to the posterior extremity, a smooth space from the beaks to the middle of the ventral margin, and another striated space, occupying a short space at the anterior extremity. There are distinct transverse wrinkles.

422. M. *discors.*—Shell interruptedly longitudinally striated, beaks tumid, cuticle green.

Mytilus discors, *Linn.* Syst. i. 1159. *Mont.* Test. Brit. 167.—Modiola discors, *Turt.* Biv. Brit. 201. t. xv. f. 4, 5.—Adhering to Ascidiæ and the roots of Fuci.

Shell seldom exceeding half an inch in length; resembling the last in its markings, but in form more tumid, broader, and the anterior side shorter.

EXTINCT SPECIES.

1. M. *depressa.*—Much depressed, ovate, narrowing towards the posterior side; surface smooth.—*Sower.* Min. Conch. t. viii. the three upper figures.—*London Clay.*—The large middle figure is probably a distinct species belonging to the *Lias.*

2. M. *pallida.*—Oblong, gibbous, smooth; inferior margin straight, posterior side slightly swelled, beaks obtuse.—*Sower.* Min. Conch. t. viii. three right hand lower figures.—In *Green Sand.*

3. M. *lævis.*—Subtriangular, very smooth, convex; inferior and posterior margins nearly straight, united by a short curve, beaks small.—*Sower.* Min. Conch. t. viii. left hand lower figure.—*Lias.*

4. M. *parallela.*—Shell transverse, anterior and posterior sides parallel, covered with transverse furrows.—*Sower.* Min. Conch. t. ix. upper right hand figure.—*Lias.*

5. M. *elegans.*—Oblong, gibbous, inferior margin straight, dentated; anterior side covered with transverse furrows; posterior side swelling, smooth, with a few transverse furrows near the base.—*Sower.* Min. Conch. t. ix. left hand upper, middle, and lower, figures.—*London Clay.*

6. M. *subcarinata.*—Oblong, smooth, gibbose; anterior side keel-formed, rather obtuse; posterior lobe convex; front concave.—*Sower.* Min. Conch. t. ccx. f. 1.—*London Clay.*

7. M. *bipartita.*—Elongated, smooth, rather gibbose; anterior side obtuse, suddenly raised above the posterior; posterior lobe irregular.—*Sower.* Min. Conch. t. ccx. f. 3, 4.—*Iron Sand.* Fig. 4. if from *Carboniferous Limestone* near Cardiff, will yet rank as a distinct species.

8. M *æqualis.*—Oblong, convex, smooth, anterior lobe large, obscurely defined.—*Sower.* Min. Conch. t. cx. f. 2.—*Iron Sand.*

9. M. *minima.*—Ovato subtriangular, smooth; front nearly straight, ends rounded, posterior lobe small, distinct.—*Sower.* Min. Conch. t. cx. f. 5, 6, 7. —*Lias.*

10. M. *cuneata.*—Elongated, convex, smooth; anterior part cuneated; back arched; front slightly concave; posterior side distinct, convex.—*Sower.* Min. Conch. t. ccii. f. 1.—*Inferior Oolite.*

11. M. *gibbosa.*—Elongated, reniform, very gibbose, smooth; back broad, arched.—*Sower.* Min. Conch. t. ccii. f. 2.—*Inferior Oolite.*

12. M. *reniformis.*—Oblong, subreniform, smooth; anterior lobe slightly expanded; posterior lobe small.—*Sower.* Min. Conch. ccxii. f. 1, 2, 3.—*Inferior Oolite.*

13. M. *imbricata.*—Oval, elongated; with imbricated ridges upon the surface; back angular, front concave.—*Sower.* Min. Conch. t. ccxii. f. 1, 2, 3.—*Inferior Oolite.*

14. M. *Hillana.*—Depressed, elongato-ovate, concentrically striated; posterior end narrow; front slightly concave; posterior lobe obscure.—*Sower.* Min. Conch. t. ccxii. f. 2.—*Lias.*

15. M. *aspera.*—Ovate elongated, posteriorly pointed; very gibbose, longitudinally striated; striæ elevated, rough, very numerous; posterior lobe obscure, wrinkled, small.—*Sower.* Min. Conch. t. ccxii. f. 4.—*Inferior Oolite.*

16. M. *plicata.* — Transversely elongated, slightly curved; back nearly straight, plaited obliquely.—*List.* Conch. t. DXXI. f. 76. *Sower.* Min. Conch. t. ccxlviii. f. 1.—*Inferior Oolite.*

17. M. *scalprum.* — Transversely elongated, slightly compressed, nearly smooth; posterior side small, undefined; anterior side slightly curved and produced.—*Sower.* Min. Conch. t. ccxlviii. f. 2.—In *Lias.*

18. M. *aliformis.*—Triangular, inflated; back straight; posterior lobe very small; anterior lobe flattish; central part convex, elongated, with projecting beaks.—*Sower.* Min. Conch. t. ccli.—In *Oolite.*

GEN. CV. LITHODOMUS.—Shell subcylindrical, rounded at both ends; beaks nearly terminal; no teeth; ligamental line nearly straight.

423. L. *lithophagus.*—Cuticle green, finely striated by the layers of growth; inside glossy, iridescent.

Mytilus lith. *Linn.* Syst. i. 1156. *Sower.* Linn. Trans. viii. 270. t. vi. f. 1, 2, 3, 4, 5.—In cavities of Limestone.

The specimens in my possession are about an inch in length, and four-tenths broad. At first, this species adheres by a byssus, which ceases to grow after a lodgment in the stone has been effected; the calcareous matter of which frequently adheres to the surface of the shell like a crust, or becomes attached to the retral extremity in a beak-like process.

UNIONIDÆ.

GEN. CVI. ANODON.—Shell transverse, rounded at both extremities, the retral one slightly truncated obliquely; ligament external, linear, and enlarged at its extremity.

424. A. *anatinus*.—Shell compressed, rising into a wing at the nearly straight ligament, beaks about one-third of the length of the shell from the extremity.

Musculus latus, *List.* An. Ang. 146. Conch. t. cliii.—Mytilus anatinus, *Linn.* Syst. i. 1158. *Mont.* Test. Brit. 172. *Maton* and *Rackett*, Linn. Trans. viii. 110. t. cxi. f. 1. *Flem.* Edin. Encyc. vii. 99. t. ccv. f. 14. —In ponds and slow running streams.

Variable in size; usually with a greenish cuticle worn at the beaks.

425. A. *cygneus*.—Shell tumid, line of the ligament a little bent; beaks about one-fourth of the length of the shell from the extremity.

M. latus, *List.* Conch. t. clvi.—Mytilus cygneus, *Linn.* Syst. i. 1158. *Mont.* Test. Brit. 170. *Maton* and *Rackett*, Lin. Trans. viii. 109. t. cxi. f. 2. *Flem.* Edin. En. vii. 92. t. ccv.—In ponds and slow running water.

This species and the former, when in their most distinctive appearances, and nearly of the same size, can be readily distinguished. The *A. anatinus* is more translucent and fragile, the anterior extremity more compressed; the hinge-line straighter and the shell rising towards the termination of the ligament, into a more decidedly compressed wing: from the ligament to the extremity, the outline is more oblique, and the anal truncature of the shell more distinct. In the *A. cygneus*, there is a convexity in the valves, a rounding of the anterior extremity, and a greater fulness of outline. But these shells differ greatly, according to age and situation, in their forms, as may be seen in the want of parallelism among the layers of growth; and the intermediate varieties are so numerous as to leave little room to doubt that the two species should be conjoined. The *Mytilus avonensis* of Montagu (Test. Brit. 172.) The *M. incrassatus* and *macula* of Sheppard (Lin. Trans. xiii. 85.) and the *Anodon paludosus* of Turton (Biv. Brit. 240.) exhibit those gradations which connect the extreme differences in form. Unless the characters of the animals furnish distinguishing marks, it is worse than useless to load the science with reputed species, depending on variable forms. According to the observations of M. Poiret, as stated by M. Draparnaud (Hist. Moll. 134.), the animal of *A. anatinus* is oviparous, while that of the *A. cygneus* is viviparous.

GEN. CVII. UNIO.—Shell transverse; hinge with an oblique crenate tooth; an elongated laminal tooth under the ligament in one valve received into a groove in the other.

426. U. *pictorum.*—Ventral margin of the shell slightly incurved; hinge-tooth of the left valve nearly entire.

Musculus angustius, *List.* Conch. t. cvxii. f. 3.—Mya pict. *Linn.* Syst. i. 1112. *Mont.* Test. Brit. 36.—Mya ovalis and M. depressa, *Don.* Brit. Shells, t. lxxxix. and ci.—Mysca ovata, *Turt.* Biv. Brit. 246.—Rivers in England.

Length 1½, breadth 3 inches; cuticle green, dusky along the layers of growth; posterior extremity slightly compressed, and obliquely truncated.

427. U. *ovalis.*—Ventral margin slightly rounded; hinge-tooth of the left valve divided.

Mytilus angustior, *List.* An. Ang. 149. Conch. t. cxlvii. 2.—M. ovata, *Don.* Brit. Shells, t. cxxii.—M. ovalis, *Mont.* Test. Brit. 34.—Mysca pictorum and M. solida, *Turt.* Biv. Brit. 245.—Rivers in England.

Nearly of the same dimensions as the last; cuticle dusky or green; more tumid, and rounded anteally, than the last.

428. M. *Batava.*—Shell wide, with both extremities nearly equally rounded.

M. pictorum, *Don.* Brit. Shells, t. clxxiv.—Mysca batava, *Turt.* Biv. Brit. 244.—In rivers, Oxfordshire.

Length 1 inch, breadth 2 inches; greenish brown; thin; the primary tooth of the left valve deeply divided.

◆

EXTINCT SPECIES.

1. U. *subconstrictus.*—About twice as broad as long, with a constriction running from the front of the shell towards the beak on the posterior side, the end of which is subtruncated.—*Sower.* Min. Conch. t. xxxiii. f. 1, 2, 3.—In *Ironstone* in the Coal formation.

2. U. *uniformis.*—Subovate, beak near the middle of the shell; both ends elliptical.—*Sower.* Min. Conch. t. xxxiii. f. 4.—*Middle Oolite.*

3. U. *acutus.*—Anterior side acute; twice as wide as the other, which is blunt or rounded. Width two and a half times its length.—*Sower.* Min. Conch. t. xxxiii. f. 5, 6, 7.—*Middte Oolite.*

4. U. *crassissimus.*—Ovate, transversely undulated or imbricated; beak recurved, acute; posterior side short, round; anterior side obscurely subcuneiform; shell very thick.—*Sower.* Min. Conch. t. cliii.—In *Lias.*

5. U. *Listeri.*—Cordate, transversely imbricated, beak recurved, acute; posterior side small; middle flattish; shell thick. — *Sower.* Min. Conch. t. cliv. f. 1, 3, 4.—*Inferior Oolite.*

6. U. *hybrida.*—Oblong, ovate, anterior side subacuminate; surface imbricated; beaks recurved, acute; shell thick.—*Sower.* Min. Conch. t. cliv. f. 2.—*Magnesian Limestone.*

7. U. *crassiusculus.*—Oblong, elliptical, depressed; valves thick; surface

marked by lines of growth; hinge strong.—*Sower.* Min. Conch. t. clxxxv.—In *Crag.*

8. U. *Solandrii.*—Transversely oblong-ovate, slightly arched, rather compressed, thin; both extremities obtuse; beaks small, rugose, hinge slender.—(Mya Pictorum, *Brander*, Foss. 105.) *Sower.* Min. Conch. t. DXVII.—In *Crag.*

9. U. *concinnus.*—Transversely oblong, ovate, depressed, nearly smooth, thick; posterior side very small; beaks prominent, recurved.—*Sower.* Min. Conch. t. ccxxiii.—*Inferior Oolite.*

10. U. *Urii.*—Transversely oblong, dorsal margin nearly straight; unequally striated by the lines of growth.—Muscle, *Ure*, Hist. Ruth. 311. t. xvi. f. 4.—Mya ovalis, *Mart.* Derb. t. xxvii. f. 1, 2.—In *Slate Clay* of the Coal Formation.

GEN. CVIII. ALASMODON.—Shell transverse, hinge with a single tooth in the right valve, recurved into a divided tooth in the left; no lateral teeth.

429. A. *margaritiferum.*—Ventral margin slightly concave; shell, towards the ligamental margin, compressed.

Musculus niger. *List.* Conch. t. cxlix.—Mya margaritifera, *Linn.* Syst. i. 1112. *Mont.* Test. Brit. 33.—Unio marg. *Turt.* Biv. Brit. 249. t. xvi. f. 1.—In gravel in rapid streams.

Length about 2, breadth upwards of 4 inches; cuticle brownish black; beaks worn, shell thick; the lines of growth fine; inside pearly. Pearls are frequently met with in this species.

CARDITADÆ.

GEN. CARDITA.—Shell inequilateral; hinge with two teeth, the shortest beneath the beaks, the other oblique and marginal beneath the insertion of the cartilage.

1. C. *striata.*—Quadrangular, gibbous; the beaks placed at one of the angles; obliquely striated from the beaks to the edge.—*Sower.* Min. Conch. t. lxxxix. f. 1.—*Inferior Oolite.*

2. C. *abrupta.*—Triangular gibbous, beaks projecting near one angle; obliquely striated; anterior side longitudinally striated; five or six transverse reflected ridges along the front.—*Sower.* Min. Conch. t lxxxix. f. 2.—*Inferior Oolite.*

3. C. *tuberculata.*—Heart-shaped, longitudinally radiated, radii tuberculated; valves equal, laterally compressed, longitudinally subcarinate, one side semilobate, the other nearly flat, beaks much incurved.—*Sower.* Min. Conch. t. cxliii. In *Green Sand.*

4. C. *lunulata.*—Rhomboidal, pointed, gibbose, transversely costated; anterior part separated by a projecting serrated keel, lunette deeply excavated; beaks involute. *Sower.* Min. Conch. t. ccxxxii. f. 1, 2. *Inferior Oolite.*

5. C. *similis.*—Rhomboidal, gibbose, transversely costated; anterior part separated by a projecting serrated keel, lunette heart-shaped, nearly flat; beaks involute.—*Sower.* Min. Conch. t. ccxxxii. f. 3.—*Inferior Oolite.*

GEN. VENERICARDIA.—Shell inequilateral, longitudinally ribbed; hinge-teeth two, oblique.

1. V. *planicosta.*—Subcordate, very thick, smooth, ribs broad and flat, about 20, expanding into each other towards the margin; a few longitudinal teeth within the posterior edge.—*Sower.* Min. Conch. t. l.—*London Clay.*

2. V. *senilis.*—Obliquely cordate, thick, with large, convex, subimbricated, naked ribs; lunette obsolete.—*Park.* Org. Rem. iii. 191. t. xiii. f. 15, 17. *Sower.* Min. Conch. t. cclviii.—In *Crag.*

3. V. *carinata.*—Transversely oblong, with 20, nearly smooth, carinated ribs; lunette obsolete.—*Sower.* Min. Conch. t. cclix.—In *London Clay.*

4. V. *deltoidea.*—Deltoid, with rounded angles; ribs 15, keel-formed; hinge callous, beaks prominent; lunette small.—*Sower.* Min. Conch. t. cclix. f. 1. —In *London Clay.*

5. V. *globosa.*—Globose; costæ 16 to 20, carinated; carinæ tuberculated, tubercles compressed.—(Chama sulcata, *Brander*, f. 100.) *Sower.* Min. Conch. t. cclxxxix. upper and middle figures.—*London Clay.*

6. V. *oblonga.*—Transversely oblong, unequal sided, subquadrangular, gibbose, with 13 knotted costæ; length about two-thirds the width; costæ strong, obtuse, irregularly knotted, margin strongly toothed.—*Sower.* Min. Conch. t. cclix. three lower figures.—*London Clay.*

7. V. *chamæformis.*—Convex, orbicular, with rather produced beaks; ribs rugged, distant, about 14; hinge large.—*Sower.* Min. Conch. t. ccccxc. f. 1.—In *Crag.*

8. V. *orbicularis.*—Orbicular, rather convex, concentrically striated; ribs about 16, not close, crenated; hinge small.—*Sower.* Min. Conch. t. ccccxc. f. 2.—In *Crag.*

9. V. *scalaris.*—Orbicular subtriangular, depressed; longitudinal sulci about 20, linear, concentrically striated; hinge-teeth long and thin.—*Sower.* Min. Conch. t. ccccxc. f. 3.—In *Crag.*

GEN. CRASSATELLA. — Shell inequilateral; hinge with two strong teeth in one valve, receiving one tooth from the other; ligament inserted in a pit at the side of the teeth.

1. C. *sulcata.*—Ovato-elongated, transversely sulcated; anterior side produced, obliquely truncated, defined by a ridge; edge-toothed within.—(Tellina sulcata, *Brander*, f. 80.)—*Sower.* Min. Conch. t. cccxlv. f. 1.—In *London Clay.*

2. C. *plicata.*—Oblong, ovate, concentrically and minutely plicated; plicæ reflected; anterior side defined by an obtuse ridge, obscurely truncated; margin toothed within.—*Sower.* Min. Conch. t. cccxlv. f. 2.—In *London Clay.*

CHAMADÆ.

GEN. CHAMA.—Beaks large, incurved, unequal; ligament external; hinge with one thick, oblique, subcrenated tooth in one valve entering a pit in the opposite.

1. C. *haleotoidea*.—Flattish, oval, uneven, with one longitudinal curved line outside, and a deep curved hollow within the deepest valve, extending from the beak around one side; the remainder very shallow, margin thin, broad, slightly fringed, crenate within; muscular impression large.—*Sower.* Min. Conch. t. xxv.—*Green Sand.*

2. C. *canaliculata*.—Oblong-oval, flattish, plaited; deeper valve with a lateral canaliculated projection.—*Sower.* Min. Conch. t. xxvi. f. 1.—*Green Sand.*

3. C. *recurvata*.—Deep valve conical, curved; beak subinvolute.—*Sower.* Min. Conch. t. xxvi. f. 2.—*Green Sand.*

4. C. *conica*.—Oblong, curved; larger valve deep, with a blunt conical beak, and a small wing; lesser valve oval, flat, with a crenated margin and wing.—*Sower.* Min. Conch. t. xxvi. f. 3.—In *Green Sand.*

5. C. *plicata*.—Transversely ovate; beak short; deeper valve with a narrow channelled wing.—*Sower.* Min. Conch. t. xxvi. f. 4.—*Green Sand.*

6. C. *digitata*.—Palmate, slightly recurved, gibbose, with 5 or 6 marginal elongated canaliculated processes; surface smooth.—*Sower.* Min. Conch. t. clxxiv.—*Green Sand* and *Middle Oolite.*

7. C. *squamosa*.—Attached by the right valve; nearly orbicular, subglobose, imbricated; lamellæ undivided, somewhat erect, anteriorly produced, and adpressed; posterior part of the right valve obsoletely costated; left valve rather convex; smooth within.—(*Brander*, 86, 87.) *Sower.* Min. Conch. t. cccxlviii.—*London Clay.*

CARDIADÆ.

GEN. CIX. ISOCARDIA.—Beaks distant, involuted, and inclining forwards; hinge with two flat oblique teeth at the beak, and a remote lateral one under the ligament.

430. I. *Cor.*—Shell tumid, smooth, brown, with the beaks clouded white.

> Bucardia, *List.* Conch. t. cclxxv. — Chama cor, *Linn.* Syst. i. 1137. *Mont.* Test. Brit. 134. *Laskey*, Wern. Mem. i. 385. t. viii. f. 7.—I. cor. *Turt.* Biv. Brit. 193. t. xiv.—Found in deep water on different parts of the coast, burrowing in the mud.

Length approaching 4 inches, and nearly as broad. Mr Bulwer has pointed out some differences between the individuals found on the east coast of Ireland, and those of the Mediterranean examined by Poli. "The foot of the Mediterranean species is much less pointed, shorter, less rugose, and of a somewhat different and lighter colour than the same part in our animal. The margin of the mantle in Poli's figure is strongly serrated, and of the same ferruginous hue as the rest of the animal; in ours it is plain, and in the healthy animal of a bright orange, while its body is of a yellowish white." Zool. Journ. No. 7. 361.

EXTINCT SPECIES.

1. I. *minima.*—Globose, subdeltoid; anteriorly slightly truncated, posteriorly flattened; cordate.—*Sower.* Min. Conch. t. ccxcv. f. 1.—*Lower Oolite.*

2. I. *tener.*—Obovate, with produced beaks; anteriorly subtruncated, posteriorly rounded; shell very thin, smooth.—*Sower.* Min. Conch. t. ccxcv. f. 2. —*Lower Oolite.*

3. T. *rostrata.*—Deltoid, ventricose; anterior side produced, pointed; posterior depressed, round.—*Sower.* Min. Conch. t. ccxcv. f. 3.—*Lower Oolite.*

4. I. *sulcata.*—Orbicular, deeper than wide, longitudinally sulcated, pearly; beaks remote.—*Sower.* Min. Conch. t. ccxcv. f. 4.—*London Clay.*

5. I. *concentrica.*—Transversely elongate, heart-shaped, concentrically sulcated; shell thin.—*Sower.* Min. Conch. t. ccccxci. f. 1.—*Lower Oolite.*

6. I. *oblonga.*—Oblong, anterior side short, ventral and dorsal margins nearly parallel, and almost straight; rounded retrally.—*Sower.* Min. Conch. t. ccccxci. f. 2.—In *Carboniferous* or *Greywacke Limestone*, Cork.

7. I. *similis.*—Transversely, rather oblong, ventricose, slightly flattened; anterior side small, turned a little up; edge of the base nearly straight.—*Sower.* Min. Conch. t. DXVI. f. 1.—In *Green Sand.* Fragments of a shell which occur in the *Suffolk Crag* have been figured (*Sower.* Min. Conch. t. DXVI. f. 2.) as resembling the recent *Isocardia cor.* They probably belong to the *marine diluvium* of the Modern Epoch.

GEN. HIPPOPODIUM.—"Shell equivalve, obliquely transverse; valves inflated, sub-bilobed; one rugged tooth at the hinge; and the indication of a small lateral one under the ligament."

1. H. *ponderosum.*—Gibbose, with irregular obtuse wrinkled ridges.—*Sower.* Min. Conch. t. ccl.—In *Lias.*

GEN. CX.—CARDIUM. COCKLE.—Beaks adjacent; hinge with two umbonal teeth, and a remote lateral one in each valve.

* *Ribs armed with spines or tubercles.*

431. C. *aculeatum.*—Shell tumid, thin, produced at the anal extremity, an angular bend behind the ligament, with 21 ribs.

Linn. Syst. i. 1122. *Penn.* Brit. Zool. iv. 90. t. 1. f. 37. *Don.* Brit. Shells, t. vi. *Mont.* Test. Brit. 77. *Turt.* Biv. Brit. 180. t. xiii. f. 6, 7.—In sandy bays.

Length nearly 4 inches; light in proportion to its size; ribs rather broad, depressed with a rough or winged middle line rising into lanceolate spines at the retral side and compressed tubercles at the opposite, the furrows transversely striated. The young of this shell is the *Cardium ciliare* of Linnæus.

432. C. *tuberculatum.*—Shell tumid, ponderous, with 21 ribs, the posterior ones tubercular, the anterior ones scaly, and, together with interstices, rough with wrinkled striæ.

Linn. Syst. i. 1122. *Don.* Brit. Shells, t. cvii. f. 2. *Mont.* Test. Brit. 568. *Turt.* Biv. Brit. 181.—Western coast of England; common in Paignton Sands, Torbay, at low spring tides.

Shell nearly the size of the last. "It is more solid and ponderous, of a more globular shape, and running in a nearly straight line on the cartilage side from the beaks; the ribs are narrower, and the grooves are deeper, both marked with strong irregular transverse striæ; the cartilage side is clothed with rather sharp tubercles, which never extend into spines, and which, at the opposite side, form thick transverse, scale-like plates: the colour is of a deeper chesnut; and the ribs on the inside extend only half way towards the beaks."—*Dr Turton.*

433. C. *echinatum.*—Tumid, thin, with 18 ribs, armed with numerous reflected spines.

Pectunculus echinatus, *List.* An. Ang. 188. Conch. t. cccxxiv.—C. ech. *Linn.* Syst. t. 1122. *Penn.* Brit. Zool. iv. 90. *Mont.* Test. Brit. 78. *Don.* Brit. Shells, t. cvii. f. 1. *Turt.* Biv. Brit. 183.—Sandy bays.

Less than the two preceding species, and more generally covered with spines; these on the anterior side are large, and curved towards the cartilage side.

We have given separate stations to these three reputed species, in deference to the authority of preceding authors, rather than from a conviction that they are distinct. Indeed, judging from specimens, given us by Montagu and Dr Leach, and found more by ourselves, we can perceive that none of the characters on which the distinctions are founded can be relied on. The ribs vary from 16 to 21, from nearly smooth to coarsely wrinkled, and the spines from sharp pointed and recurved, to broad and blunt or tubercular.

434. C. *muricatum.*—Shell elongate, slightly compressed; ribs 37, with numerous lateral tubercles.

Pectunculus tenuis, *List.* Conch. t. cccxxii.—Cardium mur. *Linn.* Syst. i. 1123.

A specimen of this shell, which I owe to the kindness of my friend Dr Coldstream, and which was found by him at Leith, is upwards of an inch and two-tenths in length, and about a tenth less in breadth; whitish, tinged with yellow, and blotched with brown; the ribs are rounded, and the tubercles, especially in the middle of the shell, are seated on the retral sides; those anteally are short, blunt, and on some of the ribs double, the retral ones are more prominent; the edge is strong and serrated; the inside has a yellow stripe from the beak, bordered on each side by a brown one; the retral side is brown and opake. We are disposed to consider the *C. nodosum* of Montagu and Turton as this shell in a young state.

435. C. *elongatum.*—Shell, rounded, compressed, with about 25 flattened prickly ribs.

Mont. Test. Brit. 82. *Turt.* Biv. Brit. 185. t. xiii. f. 8.—Devonshire and Zetland.

Shell about a quarter of an inch in diameter: produced, and a little angular at the cartilage side; the spines are broad and thin, corresponding with the size of the ribs.

436. C. *exiguum.*—Shell subtriangular, retrally truncate, with from 20 to 22 tubercled ribs.

Pectunculus exiguus, *List.* Conch. t. cccxvii.—Cardium subcordatum, *Walker's* Test. Min. 23. t. cxi. f. 83.—C. pygmæum, *Don.* Brit. Shells, t. xxxii. f. 3.—C. ex. *Mont.* Test. Brit. 82. *Turt.* Biv. Brit. 187.—Various parts of the coast from Devon to Zetland.

About half an inch in diameter, transversely striated; the ribs rounded with a mesial ridge, the tubercles are short, and somewhat arched.

** *Ribs armed with transverse scales.*

437. C. *edule.*—Common Cockle.—Shell somewhat globular, with about 26 ribs, rounded and interruptedly sulcated transversely.

Pectunculus vulgaris, *List.* An. Ang. 189. Conch. t. cccxxxiv.—Cardium edule, *Linn.* Syst. i. 1124. *Penn.* Brit. Zool. iv. 91. t. l. f. 41. *Mont.* Test. Brit. t. 76. *Don.* Brit. Shells, t. cxxiv. f. 1, 2. *Turt.* Biv. Brit. 188.—Common in sand, near low water-mark.

Diameter about 2 inches, yellowish-white; nearly equilateral, or produced posteriorly; and more or less rugged by the layers of growth.—Cockles form a very palatable food, either raw or boiled, and are considered in highest season in the spring months.

438. C. *fasciatum.*—Shell slightly compressed with about 26 ribs; those in the middle smooth, the extreme ones scaly.

Mont. Test. Brit. Sup. 30. t. xxvii. f. 6. *Turt.* Biv. Brit. 189.—Various parts of the coast.

Diameter $\frac{3}{8}$ths of an inch; nearly equilateral, whitish, with irregular rufous bands; the ribs are a little flattened; the thin transverse scales sometimes extend in front along the margin.

*** *Ribs unarmed.*

439. C. *medium.*—Shell subtriangular, truncated retrally, with a prominent line of junction; ribs about 36.

Pectunculus subrufus, *List.* Conch. t. cccxvi.—C. med. *Linn.* Syst. i. 1122. *Don.* Brit. Shells, t. xxxii. f. 1. *Mont.* Test. Brit. 83. *Turt.* Biv. Brit. 189.—English coast, rare.

Length upwards of an inch; yellowish-white, with brown blotches; ribs flattened, furrows crossed by fine striæ. This species is common to the Mediterranean and West Indies. The specimen figured by Donovan from Hartlepool, and another, referred to by Dr Turton, as taken alive at Torquay, are the only instances as yet recorded of its occurrence in our seas.

440. C. *lævigatum.*—Shell subovate, the ribs obscure and obliterated anteally; covered with a brownish-olive glossy cuticle.

Pectunculus subfuscus, *List.* Conch. t. cccxxxii.—C. læv. *Linn.* Syst. i. 1123. *Penn.* Brit. Zool. iv. 91. t. lii. f. 40. *Mont.* Test. Brit. 80. *Turt.* Biv. Brit. 190.—An inhabitant of deep water, on various parts of the coast.

Diameter about two inches; slightly truncated retrally, and produced at the anal angle; ribs faint, depressed; crossed by unequal furrows and striæ; the shell, when young, is more produced, and of a uniformly greenish-yellow.

441. C. *serratum.*—Shell ovate, lengthened, glossy, and apparently smooth.

Pectunculus lævis, *Test.* Conch. t. ccxlix.—C. ver. *Linn.* Syst. i. 1123. *Turt.* Biv. Brit. 192. t. xiii. f. 5.—West of England and Pentland Frith.

Length about an inch and a half, breadth a quarter less, white or yellowish, tinged with pink or orange retrally; the longitudinal striæ are minute, the margin crenulated on the ventral, and serrated on the oral edge.

442. C. *edentulum.* — Subovate, a single oblique tooth at the hinge, with a lateral plate on each side.

Mactra radiata, *Don.* Brit. Shells, t. clxi.—C. ed. *Mont.* Test. Brit. Sup. 29.—Found by Mr Laskey on Langston beach, near Portsmouth, after a severe storm in 1800.

EXTINCT SPECIES.

1. C. *Hillanum.*—Shell nearly circular, a little oblique, with numerous concentric striæ, retral edge straightish, longitudinally furrowed.—*Sower.* Min. Conch. t. xiv. upper fig.—*Green Sand.*

2. C. *Plumstedianum.*—Subcordate, smooth, retral part longitudinally furrowed.—*Sower.* Min. Conch. t. xiv. middle fig.—*Plastic Clay.*

3. C. *nitens.*—Roundish, hind end rather shouldered; smooth, shining; marked all over with faintish longitudinal punctated lines, which are rather more distinct at the retral side.—*Sower.* Min. Conch. t. xiv. lower fig.—*London Clay.*

4. C. *Parkinsoni.*—Gibbose, rather oblique, posterior side straightish; surface slightly rugose, with nearly forty longitudinal ribs, having slight transverse risings on each.—*Sower.* Min. Conch. t. xlix.—In *Crag.*

5. C. *Hibernicum.*—Very broad and deep; retrally truncated, concave, with a central eminence; anteally elongated, beaks incurved, small; striated longitudinally, the intervening spaces or ribs flat, with obsolete transverse scales.—*Sower.* Min. Conch. t. lxxxii. f. 1, 2, and t. DLII. f. 3.—In *Grey Wacke Limestone.*

6. C. *alæforme.*—Triangular, ventricose, longitudinally ribbed; retral side truncated, produced, near the hinge; concentrically ribbed; anteally produced, much compressed, ribbed.—*Sower.* Min. Conch. t. DLII. f. 2.—*Carboniferous Limestone.*

7. C. *proboscideum.* — Suborbicular, gibbous; retral side straight, about twenty longitudinal rows of large canaliculated spines, with two rows of lesser ones between each.—*Sower.* Min. Conch. t. clvi. f. 1.—In *Green Sand.*

8. C. *semigranulatum.*—Gibbose, transverse, subtriangular, longitudinally striated, posterior side straight, longitudinally sulcated, and largely granulated.—*Sower.* Min. Conch. t. cxliv.—*London Clay.*

9. C. *angustatum.*—Transversely elongated, thin, rather depressed; costæ twenty-seven, margin toothed; retrally truncated, anteally rounded.—*Sower.* Min. Conch. t. cclxxxiii. f. 2.—*Crag.*

10. C. *edulinum.*—Nearly orbicular, convex, slightly oblique, thick; costæ eighteen, rugose; slightly truncated retrally.—*Sower.* Min. Conch. t. cclxxxiii. f. 3.—*Crag.*

11. C. *turgidum.*—Obovate, transverse, smooth, gibbose; longitudinally striated retrally; edge minutely toothed.—(*Brander*, 96.)—*Sower.* Min. Conch. t. cccxlvi. f. 1.—*London Clay.*

12. C. *porulosum.*—Orbicular, retrally obscurely truncated, longitudinally sulcated, with a row of erect, approximate spines united near their points, alternating with each sulcus; sulci terminated by ligulate teeth. Var. spines united through their whole length by a membrane, and their bases sunk beneath the edges of the sulci.—(*Brander*, 99.)—*Sower.* Min. Conch. t. cccxlvi. f. 2.—*London Clay.*

13. C. *striatulum.*—Orbicular, convex, concentrically striated, posterior side longitudinally striated, with a toothed edge.—*Sower.* Min. Conch. t. DLIII. f. 1.—In *Lias.*

14. C. *truncatum.*—Transversely ovate, gibbose, smooth; posterior side obliquely truncated, longitudinally sulcated; beaks small.—(*C. pectinatum*, *Young*, and Brit. Geol. York. 226. t. viii. f. 5.)—*Sower.* Min. Conch. t. DLIII. f. 3.—In *Lias.*

15. C. *dissimile.*—Transversely obovate, gibbose, smooth; posterior side bounded by a small rib, longitudinally striated; front rather straight.—*Sower.* Min. Conch. t. DLIII. f. 2.—*Upper Oolite.*

16. C. *decussatum.*—Cordiform antiquated, longitudinally ribbed, anterior margin rounded; posterior side a broad area raised in the middle; length and breadth nearly equal.—*Mant.* Geol. 126. t. xxv. f. 3.

GEN. PHOLADOMYÆA.—"A transverse, thin, subhyaline, ventricose shell; the posterior portion short, rounded; the anterior more or less elongated and gaping; hinge composed of an elongated subtrigonal faveola, and a marginal plate in each valve, with a rather short external ligament; the muscular impressions two, indistinct; the sinus in the impression of the mantel large; the umbones approximated."—*Sowerby.*

1. P. *producta.*—Transversely oblong, gibbose, with six or seven angular longitudinal ridges; produced side plain.—*Sower.* Min. Conch. t. cxcvii. f. 1.—*Inferior Oolite.*

2. P. *obtusa.*—Transversely obovate, recurved, gibbose, with from seven to ten longitudinal, nearly equal, tuberculated ridges.—*Sower.* Min. Conch. t. cxcvii. f. 2.—*Inferior Oolite.*

3. P. *lirata*.—Transversely oblong, gibbose, with nine or ten longitudinal tuberculated ridges; the ridge separating the shortest side the highest.—*Sower*. Min. Conch. t. cxcvii. f. 3.—*Lias*.

4. P. *deltoidea*.—Very gibbose, obtusely triangular, with eight or nine longitudinal rugged ridges; produced side pointed.—*Sower*. Min. Conch. t. cxcvii. f. 4.—*Lias*.

5. P. *margaritacea*.—Transversely obovate, gibbose, with an obscure longitudinal keel, and several small ridges, concentrically undulated, pearly within, shortest side convex, the other slightly produced.—*Sower*. Min. Conch. t. ccxcvii. f. 1, 2, 3.—*London Clay*.

6. P. *ficedula*.—Transversely elongated, recurved, with numerous obliquely longitudinal ridges.—*Sower*. Min. Conch. t. ccxxv.—*Inferior Oolite*.

7. P. *ovalis*.—Transversely elongated, elliptical, straight, convex, with about nine diverging ridges.—*Sower*. Min. Conch. t. ccxxvi.—*Upper Oolite*.

8. P. *ambigua*.—Transversely elongated, gibbose, slightly recurved, anteriorly? gaping, with several oblique diverging ridges.—*Sower*. Min. Conch. t. ccxcvii.—*Inferior Oolite*.

9. P. *angustata*.—Transversely elongated, costated, gibbose; shortest side rounded, the opposite compressed; costæ oblique, numerous, acute.—*Sower*. Min. Conch. t. cccxxvii.—*Oolite*.

10. P. *Murchisoni*.—Oval, with large beaks, the anterior side short, six or seven prominent obtuse, knotted ribs ornament the middle.—*Sower*. Min. Conch. t. DXLV.—In *Lias* at Brora.

11. P. *acuticostata*.—Oval, elongated, with four or five large keel-shaped ribs upon the very short anterior side, and many gradually lessening ones over the middle of the shell.—*Sower*. Min. Conch. t. DXLVI. f. 1. (2?)—In *Lias*, ib.

12. P. *æqualis*.—Oval, straight; with six or eight equal slightly elevated ridges over the middle.—*Sower*. Min. Conch. t. DXLVI. f. 3.—*Oolite*.

CORBULADÆ.

GEN. CXI. **CORBULA.**—Shell triangular; hinge with a single conical tooth, and adjacent hollow in one valve, and a spoon-shaped tooth, and hollow in the other.

443. C. *striata*.—Beaks gibbous, strongly striated transversely.

Cardium striatum apicibus reflexis, *Walk*. Test. Min. 24. t. iii. f. 85. Mya inequivalvis, *Mont*. Test. Brit. 38. t. xxvi. f. 7. Corbula nucleus, *Turt*. Biv. Brit. 39. t. iii. f. 8, 9, 10.—On oyster beds, common.

Length about $\frac{4}{10}$ths, breadth $\frac{5}{10}$ths of an inch; cuticle brown; shell white, thick; larger valve very convex; smaller valve less convex; transverse striæ indistinct, but having a few longitudinal ridges; inner margin obliquely flattened, and glossy.

EXTINCT SPECIES.

1. C. *gigantea.*—Gibbose, when young suborbicular, when old transversely oblong; anterior side produced, recurved; surface concentrically furrowed near the beaks; posterior side beset with short spines. *Sower.* Min. Conch. t. ccix. f. 5, 6, 7.—*Green Sand.*

2. C. *lævigata.*—Orbicular, gibbose, smooth, and thin; beaks prominent, incurved. *Sower.* Min. Conch. ccix. f. 1, 2.—*Green Sand.*

3. C. *globosa.*—Globose, smooth; anterior side of the large valve produced into a lip; truncated; beaks equal. *Sower.* Min. Conch. t. ccix. f. 3.—*London Clay.*

4. C. *Pisum.*—Subglobose, irregular, concentrically furrowed; anterior side slightly truncated; margin of one valve produced; beaks equal.—*Sower.* Min. Conch. t. ccix. f. 4.—*London Clay.*

5. C. *revoluta.*—Transversely oblong, tumid, transversely furrowed; anterior side produced, truncated, with a carina running to the beak; margin of the larger valve prominent, inflected; beaks equal. *Sower.* Min. Conch. t. ccix. f. 8, 13.—*London Clay.*

6. C. *nitida.*—Ovate, subtrigonal, equilateral, gibbose, anteriorly truncated, smooth, valves nearly equal. *Sower.* Min. Conch. t. ccclxii. f. 1, 2, 3.—*Upper Marine Formation*, Isle of Wight.

7. C. *cuspidata.*—Transversely oblong, tumid, unequivalved, subequilateral; anteriorly carinated and cuspidated; lower margin of the left valve expanded and inflated. *Sower.* Min. Conch. t. ccclxii.—*Upper Marine Formation*, Isle of Wight.

8. C. *complanata.*—Transversely oval; elongated, depressed, and sulcated; sulci few; anterior side smallest, subtruncated and defined by an obtuse ridge; left valve enclosing the other. *Sower.* Min. Conch. t. 362. f. 7, 8.—In *Crag.*

9. C. *limosa.*—Transversely subtriangular, and longitudinally heart-shaped; beaks gibbous, surface slightly striated by the layers of growth; the shell thin. I have this shell from slate-clay, connected with *carboniferous limestone*; the shell usually adheres greatly to the substance of the bed.

MACTRADÆ.

GEN. CXII. MACTRA.—Shell subtriangular, a little gaping; beaks protuberant; hinge with one spoon-shaped tooth in each valve, and an adjacent heart-shaped cavity; in one valve there is a single lateral plate on each side closing between two in the other.

* *Lateral teeth striated; the shell strong.*

444. M. *solida.*—Shell subtriangular, subdepressed from the beaks at both extremities, with the line of junction slightly prominent; nearly equilateral.

Concha crassa, *List.* Ang. 174. t. iv. f. 24. Conch. t. ccliii. f. 87.—M. sol. *Penn.* Brit. Zool. iv. 92. t. lii. f. 43. *Don.* Brit. Shells, t. lxi. *Mont.* Test. Brit. 92. *Turt.* Biv. Brit. 67.—Sandy coasts.

Length seldom above an inch and three quarters; breadth upwards of two inches; yellowish white; obsoletely striated by the layers of growth, with a few distant concentric furrows; the beaks are nearly central, and the outline of the anal angle of the shell is slightly irregular; inside glossy white.

445. M. *truncata.*—Shell triangular, depressed from the beaks at both extremities; equilateral.

M. subtruncata, *Don.* Brit. Shells, t. cxxvi.—M. truncata, *Mont.* Test. Brit. Sup. 34. *Turt.* Biv. Brit. 68.—Sandy coasts, rare.

Length 1½, breadth 1¾th inches; yellowish-white; irregularly striated by the layers of growth. It is readily distinguished from the preceding by the greater convexity of the valves, and prominence of the beaks; by the depressions on the extremities not being raised in the middle, and by the front margin being shorter and more regularly semicircular.

446. M. *subtruncata.*—Shell subtriangular, inequilateral, concentrically striated.

(Trigonella subtruncata Da Costa, p. 198.)—M. stultorum, *Penn.* Brit. Zool. iv. 92. t. lii. f. 42.—M. subtruncata, *Mont.* Test. Brit. 93. *Turt.* Biv. Brit. 70.—Sandy shores, common.

Length $\frac{6}{10}$ths, breadth $\frac{8}{10}$ths of an inch. This species is distinguished from the two preceding, by the regularity of its concentric striæ; by the front margin being straighter towards the more produced anal, and more abruptly curved at the oral angle; the syphon marks are less distinct; it resembles the M. solida in the mesial prominence of the depressions at both sides of the beak.

447. M. *deaurata.*—"Shell oblong, flattish, inequilateral, rounded at the elongated side, and somewhat truncate at the other, with the beaks incurved."

Turt. Biv. Brit. 71. t. v. f. 8.—"Dredged up in the offing of Exmouth."

"Shell ⅝ths of an inch long, and 1¼th of an inch broad, opaque and strong; one side elongated, sloping from the beaks, and rounded; the other shorter, and somewhat angular, where it is a little open; colour dull greyish-white, covered with a shining bronzed skin, reflecting metallic lustres; coarsely and irregularly striate transversely, with a few coarser ridges towards the hinge; inside glossy, greyish white, with the margin plain; beaks rather prominent and pointed, a little inclining to the longer side."

* *Lateral teeth smooth, shell fragile.*

448. M. *stultorum.*—Shell subtriangular, slightly depressed from the beaks at each extremity; finely striated transversely, with pale longitudinal rays.

Linn. Syst. i. 1126.—Tellina radiata, *Penn.* Brit. Zool. iv. 87. t. xlix. f. 30.—M. stult. *Mont.* Test. Brit. 94. *Don.* Brit. Shells, t. cvi. *Turt.* Biv. Brit. 72.—Sandy coasts, common.

Length about 2, breadth about 2½ inches; shell thin, with a fine brownish cuticle; the striæ at the anal angle are rough, from which to the beak the depression has an obtuse mesial prominence; the depression at the opposite extremity is less distinct, and the mesial more prominent and compressed; beaks nearly central, and, together with the inside, purplish.

449. M. *cinerea.*—Shell subtriangular; beaks prominent, incurved, from which there is a depression to both extremities.

Mont. Test. Brit. Sup. 36. *Turt.* Biv. Brit. 73.—Weymouth and Paington Sands.

This species bears nearly the same relation to the preceding, as M. *truncata* bears to M. *solida.* Its valves are more concave, more angulated, and rather broader in proportion to their length. It is nearly destitute of markings.

450. M. *glauca.*—Shell oval, flattish, inequilateral and striate transversely, with the beaks incurved.

Don. Brit. Shells, t. cxxv. *Mont.* Test. Brit. DLxxi. *Turt.* Biv. Brit. 74 and 258.—Shores of Cornwall, rare.

Length nearly 2½, breadth 3½ inches; colour pale, with faint irregular glaucous rays; beaks recurved, not quite central, with a narrow gape under them.

451. M. *fragilis.*—"Shell oval-oblong, flattish, nearly equilateral and smooth, with an angular flexure at the anterior side."

Turt. Biv. Brit. 74. t. iv. f. 10.—Near Guernsey.

Length 1½, breadth near 2 inches, pale yellowish white, transparent, smooth, except a few irregular obscure transverse ridges, angular at the more produced side by a rib which runs obliquely from the hinge to the margin; beaks pointed, not quite central, with a depression under them, on the shorter side." Dr Turton considers this as the true M. fragilis of Chemnitz.

452. M. *dealbata.*—Shell transversely oval; finely striated concentrically, inequilateral.

Pult. Dorset. 31. *Mont.* Test. Brit. 95. t. v. f. 1. *Maton* and *Rackett*, Linn. Trans. viii. 68. t. i. f. 10.—Weymouth, Mr Bryer.

Length 1¼th, breadth 1⅝th inches, thin, pellucid, white; margin plain, edge sharp. According to Montagu, the middle tooth in one valve is "broad, bifurcated, angulated close to the beak; lateral teeth not very remote;" while the authors of the Descriptive Catalogue quoted above, describe the hinge thus, "cardo valvulæ unius constat ex foviola triangulari, cum dente complicato, antrorsum porrecto, et denticulo laterali, postice inclinato; alterius ex foviolis duabus triangularibus." It is probable that a more minute examination of the hinge in this and *M. deaurata* would lead to their insertion in the genus *Erycina* of Lamarck.

EXTINCT SPECIES.

1. M. *arcuata.*—Ovate, smooth, back and anterior margin arched; shell of an uniform thickness; posterior side smallest; hinge narrow; lateral teeth striated.—*Sower.* Min. Conch. t. clx. f. 1. 6.—In *Crag* at Holywell.

2. M. *dubia.*—Ovato-triangular, transversely elongated, smooth, thickened towards the margin, sides equal.—*Sower.* Min. Conch. t. clx. f. 2, 3, 4.—In *Crag.*

3. M. *ovalis.*—Oval, equilateral, smooth, thickness uniform.—*Sower.* Min. Conch. t. clx. f. 5.—In *Crag.*

4. M. *cuneata.*—Ovate, smooth, depressed towards the front, anterior margin acute-angular.—*Sower.* Min. Conch. t. clx. f. 7.—In *Crag.*

GEN. CXIII. GOODALLIA.—Shell triangular, equivalve inequilateral, closed; hinge with two teeth in one valve, and a triangular cavity between them; in the other valve a single tooth; a lateral simple tooth in each valve on the produced side.

453. G. *triangularis.*—Shell with the inner margin toothed.

Mactra tri. *Mont.* Test. Brit. 99. t. iii. f. 5.—G. tri. *Turt.* Biv. Brit. 77. t. vi. f. 14.—English and Irish coasts.

Length 2 lines, breadth 3 lines; strong opake, smooth, white; beaks prominent, obtuse.

454. G. *minutissima.*—Shell with the inner margin plain.

Mactra min. *Mont.* Test. Brit. Sup. 37.—G. min. *Turt.* Biv. Brit. 77. t. vi. f. 15.—Coast of Devon and Cornwall.

This species resembles the preceding, but the shell is not quite so angulated, nor so long in proportion to its breadth; nor has it ever occurred so large.

GEN. CXIV. LEPTON.—Shell flat, nearly orbicular, equivalve inequilateral, a little open at the sides; hinge of one valve with a single tooth and a transverse linear lateral one on each side of the other valve; with a cavity in the middle, and a transverse, deeply cloven, lateral tooth on each side, the segments of which divaricate from the beak.

455. L. *squamosum.*—Shell punctured in a scale-like manner.

Solen squam. *Mont.* Test. Brit. 565.—L. squam. *Turt.* Biv. Brit. 62. t. vi. f. 1, 2, 3.

Length $\frac{4}{10}$ths, breadth $\frac{5}{10}$ths of an inch; pellucid, thin, white; obscurely wrinkled concentrically; beak small, pointed; inside with very fine longitudinal striæ radiating from the hinge.

456. L. *nitidum.*—Shell glossy, slightly striate transversely.

Turt. Biv. Brit. 63....From corallines, in Torbay.

Shell half the size of the last, which it resembles in shape and hinge, but is of a lucid, pale, glossy horn-colour, without punctures.

GEN. CXV. KELLIA.—Shell somewhat globular, equivalve, closed; hinge with two approximate teeth, and a remote lateral tooth in one valve, and a concave tooth and remote lateral one in the other.

457. K. *suborbicularis.*—Shell equilateral, gibbous.

Mya sub. *Mont.* Test. Brit. 39. t. xxvi. f. vi.—Kellia sub. *Turt.* Biv. Brit. 57. t. xi. f. 5, 6.—In cavities of limestone or the roots of sea-weeds.

About half an inch in diameter; cuticle thin, greenish, prismatic, faintly striated; valves convex, the ventral margin nearly straight, the ends rounded; beaks not very prominent, slightly turned to one side. Montagu considered it to be a *borer*, in limestone, in some situations, but apparently without sufficient evidence.

468. K. *rubra.*—Shell slightly transverse, inequilateral.

Cardium læve apice minuto, *Walk.* Test. Min. 24. t. iii. f. 86.—Cardium rubrum, *Mont.* Test. Brit. 83. t. xxvii. f. 4.—Kellia rubra, *Turt.* Biv. Brit. 57. t. xi. f. 7, 8.—Crevices of marine rocks and roots of sea-weeds towards low water-mark.

About the tenth of an inch in diameter, smooth, or appearing as if very finely shagreened, of an uniform rich crimson, often paler, or covered with a rough green or brown coat; inside glossy purple; beaks near one end, prominent, under which the margin slopes in an incurved manner towards the smaller end; teeth minute, as in the last.—The preceding description is that of Dr Turton, to which he has added, that, in the month of June, he has found the old shells containing about twelve perfectly formed young ones. I have found a shell in abundance, in Zetland, at the roots of sea-weeds towards low water mark, agreeing with the preceding, except in the cuticle being thin and of a pale greenish colour, with prismatic hues.

GEN. CXVI. LORIPES.—Lenticular, teeth obsolete, behind which is a linear marginal groove for the ligament; syphons short, united, the foot long and cylindrical.

459. L. *lacteus.*—Orbicular, nearly equilateral, slightly truncated retrally.

Tellina lactea, *Linn.* Syst. i. 1119. *Mont.* Test. Brit. 10. t. ii. f. 4.—Lucina lactea, *Turt.* Biv. Brit. 112. t. vii. f. 4, 5.—English shores.

Diameter about three quarters of an inch; whitish; irregularly striated transversely, beaks prominent, slightly inclining, before which is a small lunule; a plain tooth in one valve closing between two plain ones in the other.

460. L. *leucoma.*—Shell with regular transverse striæ.

Lucina leucoma, *Turt.* Biv. Brit. 113. t. vii. f. 8.—South shores of England.

Resembles greatly the last, but is distinguished, according to Dr Turton, by a greater convexity, by more regular, crowded, raised, transverse striæ, which are crossed by extremely fine longitudinal lines; the last, however, not always visible.

GEN. CXVII. ERVILIA.—Shell oval, equivalve, inequilateral, closed; hinge with a single strong erect cloven tooth in one valve, closing into a deep cleft between two small laminar divergent elevations in the other.

461. E. *nitens.*—Beaks prominent, rounded at both extremities, regularly and finely striated concentrically.

Mya nitens, *Laskey*, Wern. Mem. i. 375, t. viii. f. 4. *Mont.* Test. Brit. Sup. 165.—Ervilia nitens, *Turt.* Biv. Brit. 56, t. xix. f. 4.—At Dunbar, Mr Laskey.

Length nearly a quarter of an inch, a little more in breadth; flattish, a little tapering at the longest side; colour glossy pink; margin entire.

GEN. CXVIII. AMPHIDESMA.—Shell inequilateral; hinge with a projection for the support of the internal cartilage in each valve, and one or two small adjacent teeth.

* *No lateral teeth.*

462. A. *convexum.*—Shell convex, transversely ovate, rounded anteally, truncate retrally.

Mya declivis, *Don.* Brit. Shells, t. lxxxii.—Anatina con. *Turt.* Biv. Brit. 44. t. iv. f. 1, 2.—Sandy bays, rare.

Length 1½, breadth nearly 2½ inches; very convex, thin, and brittle, of a rusty white colour; irregularly wrinkled concentrically, with two or three obsolete longitudinal folds; support for the ligament narrow.

463. A. *pubescens.*—Shell slightly compressed, transverse, anteally rounded, retrally broadly truncate; surface rough.

Mya pubescens, *Pult.* Dorset. 27. *Mont.* Test. Brit. 40.—Anatina pub. *Turt.* Biv. Brit. 45. t. 4. f. 3.—Southern shores of England.

Length 2, breadth 2½ inches; white, the surface of the shell closely covered with minute tubercles, giving it a rough aspect; slightly wrinkled by the lines of growth, ventral margin and the dorsal one behind the beaks nearly straight, the latter with a contiguous ridge; support for the ligament broad, with an elevated retral margin. This is probably the *Mya declivis* of Pennant, Brit. Zool. iv. 79. and the young state of which, seems to be the *Tellina fragilis* of the same author, Ib. 86. t. xlvii. f. 26.

464. A. *truncatum.*—Convex, wedge-shaped, anteal end short, obliquely truncate.

Anatina truncata, *Turt.* Biv. Brit. 46. t. iv. f. 6.—In cavities of rocks. —Torbay.

Length ½, breadth ¾ths of an inch; rough, striate transversely; anteally, the dorsal margin slopes rapidly, the retral margin is truncate; the retrodorsal and ventral margins nearly straight.

In the three preceding species, the support for the ligament is triangular, and the point of attachment is the centro-umbonal margin; in the remaining species, the point of attachment is on the flat surface of the tooth, which is parallel with the mesial plane.

465. A. *compressum.* — Triangularly ovate, compressed, rounded at both extremities.

Concha tenuis, *List.* An. Ang. 174. Conch. t. cclii. f. 88.—Venus borealis, *Penn.* Brit. Zool. iv. 96.—Tellina plana, *Don.* Brit. Shells, t. lii. f. 1.—Ligula compressa, *Mont.* Test. Brit. 96.—Listera compressa, *Turt.* Biv. Brit. 51. t. v. f. 1.—In the mud of estuaries.

Length $1\frac{8}{10}$th, breadth $2\frac{3}{10}$th inches; thin, translucent, yellowish-white, finely but irregularly striated by the lines of growth; beaks very small; a single tooth in one valve locking into a bifid tooth in the opposite, adjacent to the ligament.

466. A. *declive.*—Compressed, oval-oblong, angular, truncate, and open retrally.

Mya declivis, *Mont.* Test. Brit. t. i. f. 2.—Anatina declivis, *Turt.* Biv. Brit. 47.—Torbay, Dr Turton.

Length 1, breadth 1½ inches; slightly compressed, white, minutely shagreened, beak nearest the retral extremity; anteal extremity broad, rounded. This species nearly resembles the *A. pubescens*, but is distinguished, according to Dr Turton, " by the large oval projecting teeth, which extend forwards, and have no lateral attachment."

467. A. *prætenue.*—Shell slightly compressed, transversely ovate, and rounded at both extremities.

Mya prætenuis, *Pult.* Dorset. 28. *Mont.* Test. Brit. 41.—Anatina præt. *Turt.* Biv. Brit. 48. t. iv. f. 4.—Southern shores of England.

Length 1 inch, breadth 1½; rough, retral extremity longest. It is distinguished from the preceding by its rounded retral extremity.

468. A. *distortum.*—Convex, suborbicular, wrinkled.

Mya distorta, *Mont.* Test. Brit. 42. t. i. f. 1.—Anatina dist. *Turt.* Biv. Brit. 48. t. iv. f. 5.—In crevices of rocks, rare.

Diameter nearly an inch; variable in form from confined situations in which it occurs; rough, wrinkled by the layers of growth; distinguished readily from the preceding by the rounded projecting support for the ligament.

** *Hinge, with a lateral tooth on each side, in one of the valves.*

469. A. *prismaticum.*— Transversely oblong, rounded anteally, pointed retrally.

Mya prismatica, *Laskey,* Wern. Mem. i. 377. *Mont.* Test. Brit. Sup. 23. t. xxvi. f. 3.—A. prism. *Turt.* Biv. Brit. 52. t. v. f. 3.—Sandy bays.

Length half an inch, breadth an inch; thin, transparent, glossy, and iridescent; obsoletely striated concentrically, ventral margin slightly rounded; a single erect tooth in both valves, with corresponding pits for their reception. A specimen, presented to me by Mr Laskey, by whom the shell was first discovered, is greatly more obtuse at the retral extremity.

470. A. *album.*—Transversely ovate, subtriangular; rounded at both ends, the beak nearest the retral extremity.

Mactra alba, *Wood*, Linn. Trans. vi. 174. t. xvi. f. 9–12. Ligula Boysii, *Mont.* Test. Brit. 98. t. iii. f. 7.—Amphidesma Boysii, *Turt.* Biv. Brit. 53. t. v. f. 4, 5.—Sandy shores, frequent.

Length half an inch, breadth three-quarters, glossy, pellucid; slopes from the beak on both sides; the ventral margin rather suddenly rounded; a single umbonal denticle in each valve, and a large lateral tooth on each side in one valve; it is readily distinguished by its shortness and pellucidity.

471. A. *tenue.*—Subtriangular, equilateral with a rounded ventral margin.

Ligula tennis, *Mont.* Test. Brit. 572. t. xvii. f. 7.—A. tenue, *Turt.* Biv. Brit. 53.—South coast of England.

Length a quarter of an inch, breadth a little more; white, concentrically wrinkled, compressed, beaks produced, central; hinge with one bifurcated tooth, and a remote lateral one in one valve, and a single plain tooth in the other.

DONACIDÆ.

GEN. CXIX. DONAX.—Transversely subtriangular, retrally short and truncated; hinge with two teeth in both valves; lateral teeth rather remote.

* *Inner margin crenulated.*

472. D. *trunculus.* — Shell with numerous minute simple longitudinal striæ, becoming obsolete towards the anteal extremity.

Tellina intus ex viola purpurascens, in ambitu serrata, *List.* An. Ang 190. Conch. t. ccclxxxvi. f. 217.—D. trun. *Linn.* Syst. i. 1127. *Penn.* Brit. Zool. iv. 93. t. lv. *Mont.* Test. Brit. 103. *Turt.* Biv. Brit. 123. —Sandy shores, common.

Length five-eighths of an inch, breadth one inch and a quarter; a yellowish-white cuticle, inside purple, retrally obliquely truncated, the anal angle rounded; anteally compressed, rounded, with the dorsal margin nearly straight.

473. D. *denticulata.*—Shell with numerous fine punctured longitudinal striæ.

Tellina purpurascens, *List.* Conch. t. ccclxxvi. f. 218.—D. dent. *Linn.* Syst. i. 1127. *Penn.* Brit. Zool. iv. 93. *Mont.* Test. Brit. 104. *Turt.* Biv. Brit. 124.—English shores, rare.

Length about half an inch, breadth an inch; whitish, rayed with purple. It is more suddenly truncated retrally than the preceding species, and rough with ridges.

** *Inner margin entire.*

474. D. *complanata.*—Transversely elongated, smooth, with a longitudinal white band.

Tellina variegata, *List.* Conch. t. ccclxxxiv.—D. comp. *Mont.* Test. Brit. 106. *Turt.* Biv. Brit. 125.—English shores, rare.

Length three-quarters of an inch, breadth an inch and a half; glossy, variegated, with a white band from the beak towards the anal angle; a few obsolete concentric furrows, the inside purple; retral extremity more produced than in either of the preceding species.

475. D. *plebeia.*—Triangularly ovate, smooth, with two longitudinal fulvous bands.

Tellina parva, *List.* Conch. t. ccclxxxix. *Pult.* Dorset. 32. *Mont.* Test. Brit. 107. t. v. f, 2. *Turt.* Biv. Brit. 126.—English and Scottish shores, rare.

Length half inch an inch, breadth three-quarters; broad, thick and strong; yellowish; the teeth large; the fulvous bands are sometimes absent.

476. D. *rubra.*—Wedge-shaped, smooth, uniformly red.

Mont. Test. Brit. Sup. 38. *Turt.* Biv. Brit. 129. t. x. f. 14.—Southern shores of England, rare.

About an eighth of an inch in diameter, semitransparent; inside reddish; beaks prominent.

GEN. CXX. CAPSA. — Shell transverse, abbreviated anteally; hinge with two teeth in both valves; no lateral teeth.

477. C. *castanea.*—Strong, transversely oblong, with a few obsolete concentric ridges.

Donax cast. *Mont.* Test. Brit. 573. t. xvii. f. 2.—Capsa cast. *Turt.* Biv. Brit. 128. t. x. f. 13.—Southern shores of England, rare.

Length a quarter, and breadth half an inch; chesnut, with a deeper coloured curved band from the hinge towards the longest side; inside chesnut, margin plain; one of the teeth large, the other small, in each valve.

GEN. CXXI. TELLINA.—Shell transverse or suborbicular, with a flexuous plait at the posterior side; hinge with two teeth in one or both valves; lateral ones generally remote.

* *With two teeth in one valve, and the shell oval.*

478. T. *fragilis.*—Transversely ovate, subsulcated by the layers of growth; retrally truncated.

Penn. Brit. Zool. iv. 86. t. xlvii. f. 26.—English shores.

Length nine-tenths, breadth one inch and three-tenths; white; the left valve largest; the striæ wrinkled behind the fold; indistinct longitudinal striæ, and some minute oblique ones, apparently confined to the cuticle; inside striated near the margin at which the shell is slightly bevelled; an indistinct ridge from the beak to the posterior muscular impression; no lateral teeth. The specimens in my possession which agree with the figure in "British Zoology," have the teeth indistinct.

479. T. *lineata.*—Shell oval, with crowded transverse striæ, one valve double toothed, one of the teeth cloven, with a lateral one on each side, the other valve with a single cloven tooth and no lateral ones.

Turt. Biv. Brit. 99. t. vii. f. 1.—Teignmouth Bay.

Length ⅝ths, breadth ⅞ths of an inch; white, with a pale and longitudinal stripe from the beaks to the oral extremity; thin, semitransparent, with numerous fine transverse striæ, strongest at the extremities.

480. T. *punicea.*—Oval, oblong, with transverse striæ, and minute longitudinal ones; one valve double toothed, with a single lateral one, the other with a single primary and lateral tooth.

Turt. Lin. Trans. iv. 194.—T. læta, *Pult.* Dorset. 29. *Mont.* Test. Brit. 57.—T. inæquistriata, *Don.* Brit. Shells, t. cxxiii.—T. punicea, *Turt.* Biv. Brit. 100.—South coast of England and Dunbar, rare.

Length three-quarters of an inch, breadth upwards of an inch; variously tinged with pink; the concentric striæ are regular and strong; one of the primary teeth bifid, the lateral one contiguous, broad and oblique.

481. T. *fabula.* — Shell oval, contracted retrally; the left valve obliquely striated.

Turt. Linn. iv. 194.—*Don.* Brit. Shells, t. xcvii.—*Mont.* Test. Brit. 61. —*Turt.* Biv. Brit. 101.—Sandy coasts, common.

Length half an inch, breadth three quarters; thin, glossy, white and iridescent; concentrically striated irregularly; a single tooth in the right valve, with a minute adjacent denticle; two teeth in the left, and a rounded lateral one.

482. T. *similis.*—Shell oval, with both valves obliquely striated.

Sower. Brit. Misc. t. lxxv.—*Turt.* Biv. Brit. 102.—Southern shores of England.

This shell is not so broad as the preceding, being broader and more abbreviated retrally; the oblique striæ are finer and more remote, and there is a lateral tooth in each margin.

483. T. *donacina.*—Shell oval, transversely striate, very obtuse anteally; in one valve two teeth, and a lateral one on each side; in the other a single primary tooth.

Linn. Syst. i. 1118.—*Mont.* Test. Brit. 58. t. xxvii. f. 3.—*Turt.* Biv. Brit. 103.—Various parts of the coast, rare.

Length three quarters, breadth one inch and a quarter; yellowish, with red, often interrupted, longitudinal rays; hinge with a single cloven tooth in one valve, and no lateral ones; in the other, two teeth, one of them cloven, and a strong, rather remote, lateral tooth on each side.

484. T. *bimaculata.*—Oval-triangular, slightly striate transversely, a little angular retrally; in one valve two teeth, and lateral ones; in the other a single tooth, and lateral ones.

T. lata, *List.* Conch. t. ccclxxxv.—T. bim. *Linn.* Syst. 1120.—*Don.* Brit. Shells, t. xix. f. 1.—*Mont.* Test. Brit. 69.—*Turt.* Biv. Brit. 103. t. viii. f. 5.

Length half an inch, breadth a little more, with two red spots under the beaks, or with interrupted sagittate rays.

485. T. *squalida.*—Oval-oblong; produced and pointed retrally; in one valve two teeth, and a single lateral one; in the other a single tooth and two lateral ones.

Pult. Dorset. 29.—*Mont.* Test. Brit. 56.—T. depressa, *Don.* Brit. Shells, t. clxiii.—*Turt.* Biv. Brit. 105.—English and Irish coasts.

Length about an inch, breadth nearly two inches; colour reddish; concentrically striated, with irregular ridges of growth.

** *With two teeth in each valve, and the shell oval.*

486. T. *striata.*—Oval-triangular, with crowded transverse striæ, and minute longitudinal ones; each valve with two lateral teeth.

Mont. Test. Brit. 60. t. xxvii. f. 2.—*Turt.* Biv. Brit. 106.—Southern shores of England, rare.

Length an inch, breadth three quarters; rosy-white, with fine and regular concentric striæ.

487. T. *tenuis.*—Oval-triangular; irregularly striate transversely; one of the valves with a lateral tooth.

T. levis, *List.* Conch. t. ccccv. f. 251.—T. planata, *Penn.* Brit. Zool. iv. 87. t. xlviii. f. 29.—T. tenuis, *Don.* Brit. Shells, t. xix. f. 2.—*Mont.* Test. Brit. lix.—*Turt.* Biv. Brit. 107.—Sandy shores, common.

Length about half an inch, breadth three quarters; reddish, with generally deeper bands; compressed, somewhat truncated, and angular at the anal extremity.

*** *In each valve two teeth, and the shell somewhat orbicular.*

488. T. *maculata.*—Suborbicular, and equivalve, with rough transverse striæ, and minute longitudinal ones, each valve with two lateral teeth.

Turt. Biv. Brit. 108.—Bantry Bay.

Length an inch, breadth an inch and quarter; whitish, with dark irregular spots; the interstices of the distinct concentric striæ are longitudinally striated, which gives a roughness to the aspect of the shell.—This is probably identical with T. obtusa of *Sowerby*, Min. Conch. t. clxxix. f. 4, a reputed crag fossil.

489. T. *crassa.*—Suborbicular, unequivalve, nearly equilateral, with transverse striæ, and obscure longitudinal ones; the left valve with a remote lateral tooth on each side.

Pectunculus planus, *List.* Conch. t. 299.—T. crassa, *Penn.* Brit. Zool. iv. 87. t. xlviii. f. 28.—T. proficua, *Pult.* Dorset. 29. *Mont.* Test. Brit. 69. T. reticulata, *Maton* and *Rackett*, Linn. Trans. viii. 54. t. i. f. 9. T. fausta, *Pult.* Dorset. 29. *Mont.* Test. Brit. 64. *Don.* Brit. Shells, t. xcviii. rigida, ib. t. ciii.—Southern shores of England and Ireland, rare in Scotland.

Length from 1 to 2 inches, and a little more in breadth; strong, semitransparent, whitish, tinged with yellow, or rayed longitudinally with pink; left valve shallow; internally a ridge from the beak to the anteal muscular impression.

◆

EXTINCT SPECIES.

1. T. *obliqua.*—Nearly orbicular, convex, oblique, smooth; anterior side slightly defined by a longitudinal wave.—*Sower.* Min. Conch. t. clxi. f. 1.—*Crag.*

2. T. *ovata.*—Ovate, convex, smooth; equilateral, with a slight retral wave.—*Sower.* Min. Conch. t. clxi. f. 2.—*Crag.*

3. T. *obtusa.*—Transversely ovate, convex, concentrically striated; margin obtuse; sides very unequal.—*Sower.* Min. Conch. t. clxxix. f. 4.—In *Crag.*

4. T. *Branderi.*—Obovate, depressed, smooth, with a small sinus on the anterior margin; beak rather prominent.—(T. bimaculata, *Brander,* f. 102.)—*Sower.* Min. Conch. t. ccccii. f. 1.—*London Clay.*

5. T. *filosa.*—Obovate, depressed, transversely striated; posterior side angular; anterior rounded; striæ elevated, acute, numerous, enlarged posteriorly.—*Sower.* Min. Conch. t. ccccii. f. 2.—*London Clay.*

6. T. *ambigua.*—Oval, elongated, convex, obscurely sulcated; left valve thickest, curved, and with only one huge tooth.—*Sower.* Min. Conch. cccciii. —*London Clay.*

7. T. *striatula.*—Transversely ellíptico-lanceolate, convex, smooth; posterior part shortest, longitudinally striate; striæ obscure.—*Sower.* Min. Conch. t. cccclvi. f. 1.—*Green Sand.*

8. T. *inequalis.*—Oval, convex, smooth; posterior extremity obtuse; its surface finely striated from the beak; anterior side largest, rounded.—*Sower.* Min. Conch. t. cccclvi. f. 2.—*Green Sand.*

GEN. CXXII.—PSAMMOBIA.—Shell transverse, oblong, or oval, a little gaping, with a flexure from the beak to the anal angle; hinge with two teeth in one or both the valves; lateral teeth none.

* *With two teeth in one of the valves only.*

490. P. *florida.*—Oval-oblong, with close-set transverse striæ, and minute longitudinal ones.

Turt. Biv. Brit. 86. t. vi. f. 9.—English and Irish coasts.

Length half an inch, breadth an inch, rather convex; variously marked with different colours; sloping gently from the beaks; nearly equally rounded at both extremities; a single cloven tooth in one valve, and a cavity on each side for the reception of the two teeth of the opposite valve.

491. P. *costulata.*—Oval-oblong, with transverse striæ, and minute longitudinal ones, and oblique longitudinal ribs at the posterior end.

Turt. Biv. Brit. 87. t. vi. f. 8.—Torbay.

Length half an inch, breadth an inch; variously coloured; dorsal margin nearly even; slightly truncated obliquely on the retral extremity, where there are about twelve longitudinal ribs; a slightly cloven tooth in one valve, closing between two in the other, one of which is slightly cloven.

492. P. *fragilis*.—Suboval, tumid, flexuous and produced at the posterior end, with transverse laminal striæ, and minute longitudinal ones.

Tellina fragilis, *Linn.* Syst. i. 117.—T. jugosa, *Brown*, Wern. Mem. ii. 506. t. xxiv. f. 2.—P. fragilis, *Turt.* Biv. Brit. 88. t. vii. f. 11, 12.—Coast of Ireland.

Length about an inch, breadth an inch and a half; brownish; very tumid at the larger end, and sloping to a rough flexuous point at the other; teeth strong, elevated; in one valve a cloven tooth, with a cavity on each side for the reception of the two teeth of the opposite valve.

493. P. *Laskeyi*.—Oval-oblong; slightly contracted retrally, with a few obsolete concentric ridges.

Tellina Lask. *Mont.* Test. Brit. Sup. 28. t. xxviii. f. 3.—Frith of Forth, Mr Laskey.

Length half an inch, breadth three quarters; purplish white, with an oval cuticle; beaks slightly prominent, retrally; slightly obtuse; two approximate subbifid teeth in one valve, and a single tooth in the other.

494. P. *Ferroensis*.—Transversely-oblong; obliquely truncated retrally; concentrically striated, with a few longitudinal ribs behind the fold.

Tellina rufo maculata, *List.* Conch. t. cccxciv.—T. incarnata, *Penn.* Brit. Zool. iv. 88. t. xlvii. f. 31.—T. Fer. *Mont.* Test. Brit. 55.—P. Fer. *Turt.* Biv. Brit. 94.—Sandy bays, common.

Length three quarters of an inch, breadth two inches; reddish, with longitudinal rays; compressed; rounded anteally; concentric striæ distinct, especially behind the fold, where they are decussated on the longitudinal ridges, the markings strongest on the left valve; hinge with two teeth in each valve, one large and bifid.

495. P. *solidula*. — Suborbicular, slightly angular retrally, with minute transverse striæ, and distant obsolete ridges of growth.

Concha parva, *List.* An. Ang. 175.—Conch. t. ccccv. f. 251.—T. carnaria, *Penn.* Brit. Zool. iv. 88. t. 49. f. 32.—T. sol. *Mont.* Test. Brit. 63.—P. sol. *Turt.* Biv. Brit. 95.—On gravelly shores imbedded near low water-mark.

Length about three quarters of an inch; breadth a little more; white, more or less tinged or banded with pink; convex; the cartilage side sloping rather suddenly.

496. P. *rotundata*.—Nearly orbicular; convex; beaks prominent, with numerous obsolete transverse striæ.

Tellina rot. *Mont.* Test. Brit. 71. t. ii. f. 3.—Lucina rot. *Turt.* Biv. Brit. 114. t. vii. f. 3.—South coasts of England and Ireland.

Diameter about an inch; yellowish-white; thin, translucent; slightly truncated retrally; beaks a little inclining; hinge with two teeth in one valve, the largest bifid, and slightly diverging; inner margin slightly striate longitudinally.

497. P. *polygona.*—Subovate, with transverse and minute longitudinal striæ; retral extremity angular, and undulate at the margin.

Tellina pol. *Mont.* Test. Brit. Sup. 27. t. xxviii. f. 4.—P. pol. *Turt.* Biv. Brit. 96.—Frith of Forth.—Mr *Laskey.*

Length half an inch, breadth a little more; whitish; anteally rounded; teeth, in one valve, two, large and distinct; in the other a large triangular bifid tooth, with an approximate small one.

498. P. *strigillatus.*—Oblong, striate in two directions on the anteal side, with one of the teeth oblique and laminar.

Chama angusta, *List.* Conch. t. ccccxvi.—P. stri. *Turt.* Biv. Brit. 97. t. vi. f. 13.—Torbay and Cornwall.

Length an inch, breadth 2 inches; narrower at the retral side; yellowish-white; ventral margin straight; about 30 longitudinal striæ.

499. P. *scopula.*—Kidney-shaped; striate in two directions on the retral side, with all the teeth erect.

Turt. Biv. Brit. 98. t. 6. f. 11, 12. Exmouth.

Length three-eighths, breadth six-eighths; glossy white. It is distinguished from the last by the sides being more open where the valves are a little reflected; in the middle there is an evident contraction; the oblique striæ are not more than 20, the beaks are more prominent, and the teeth are all erect, and close together.

◆

EXTINCT SPECIES.

1. P. *solida.*—Transversely elongated, depressed, tumid, nearly smooth, slightly curved; an obtuse carina marks the retral side.—*Sower.* Min. Conch. t. 342.—Upper marine formation, Headon Hill.

GEN. CXXIII. ASTARTE.—Suborbicular or transverse; subinequilateral; hinge with two diverging teeth; a depression before the beaks; impression of the cloak entire, exhibiting no syphon cicatrix.—This genus, instituted by Sowerby (Min. Conch. ii. 85.), is identical with the subsequently announced *Crassina* of Lamarck.

* *Margin crenulated.*

500. A. *sulcata.*—Shell suborbicular, flattish, with broad, concentric furrows, obsolete towards the beaks and sides.

Venus sulcata, *Mont.* Test. Brit. 131.—England, and north of Scotland.

Diameter about seven-eighths of an inch; white, with an opake brown cuticle; strong and thick; beaks prominent, inclining, under which is a lanceolate depression; cartilage side likewise depressed, but narrower, exterior margin rounded; inside white, smooth and glossy at the margin, the middle dull and rough; edge crenulated; hinge with three teeth in one valve, the middle one larger than the others, with a deep cavity in one valve, into which the two teeth of the other valve lock. Montagu states his having received this shell as English from Mr Sowerby, and that according to Mr Swainson, it is known in the north of Scotland by the trivial name of " *Brown circular furrowed northern Cockle*,"—a descriptive epithet we have not heard of, and which seems somewhat different from the usual provincial appellations.

501. A. *Danmoniæ.*—Shell transversely ovate, with strong, regular, equidistant, concentric smooth ridges.

Venus Dan. *Mont.* Test. Brit. Sup. 45. t. xxix. f. 4.—Crassina sulcata, *Turt.* Biv. Brit. 131. t. xi. f. 1, 2.—English and Scottish coasts.

Length an inch, breadth an inch and a quarter; shell white, with a dark brown cuticle; beaks nearly central, inclining, below which is a lanceolate depression; margin within glossy and crenulated; teeth, two in each valve.

* *Margin plain.*

502. A. *Scotica.*—Shell transversely ovate, with strong, regular, equidistant, concentric, smooth ridges.

Venus Scotica, *Maton* and *Rackett*, Linn. Trans. viii. pt. 1. t. ii. f. 3.—*Mont.* Test. Brit. Supp. 44.—Crassina Scotica, *Turt.* Biv. Brit. 130. t. xi. f. 3, 4.—Various parts of the coast, from Devon to Zetland.

Length $\frac{7}{10}$ths, breadth an inch; white with a brown cuticle. It is principally distinguished from the preceding by the greater compression of the ventral margin, the shortness of the lunule, and in the inside being less rough, and the margin entire.

503. A. *compressa.*—Shell subtriangular, rounded in front; beaks very prominent, and inclining; obsoletely and irregularly sulcated transversely.

Venus compressa, *Mont.* Test. Brit. Sup. 43. t. xxvi. f. 1.—*Maton* and *Rackett*, Linn. Trans. viii. t. ii. f. 2.—Cyprina compressa, *Turt.* Biv. Brit. 136. t. xi. f. 20–23.—Coast of Scotland.

Diameter about half an inch; shell white, with a brown cuticle; cartilage slope but little rounded; the depression in front of the beaks sudden. While the figure in the Linn. Trans. above quoted belongs to this species, the description is that of *A. sulcata.* I possess dead valves from St Andrew's Bay upwards of an inch and three-tenths in length. Is this distinct from *Crassina semisulcata* of Dr Leach, Annals of Philosophy, xiv. 204.? Even by the aid of authentic specimens, I have failed to procure a specific difference.

EXTINCT SPECIES.

1. A. *lurida.*—Transversely oblong, convex, depressed, with many transverse undulations; lunette elliptical, sharp; margin crenulated within, nearly straight ventrally.—*Sower.* Min. Conch. t. cxxxvii. f. 1.—*Inferior Oolite.*

2. A. *elegans.*—Transversely oblong, convex, depressed, with many small transverse costæ, lunette cordate; margin crenulated within.—*Sower.* Min. Conch. t. cxxxvii. f. 3.—*Inferior Oolite.*

3. A. *cuneata.*—Subcordate, acuminated, gibbose, with small transverse costæ; lunette cordate; margin entire within.—*Sower.* Min. Conch. t. cxxxvii. f. 2.—*Upper Oolite.*

4. A. *plana.*—Nearly orbicular, depressed, surface plain; lunette elongated, acute, deep; margin entire.—*Sower.* Min. Conch. 179. f. 2.—*Crag?*

5. A. *obliquata.*—Obovate, transversely depressed; with many oblique concentric striæ upon the surface; margin crenulated.—*Sower.* Min. Conch. t. clxxix. f. 3.—In *Crag.*

6. A. *lineata.*—Obovate, transversely depressed; slightly truncated; with a few concentric acute ridges, and many minute intervening striæ upon the surface; lunette lanceolate, small; margin entire.—*Sower.* Min. Conch. t. clxxix. f. 1.—*Upper Oolite.*

7. A. *excavata.*—Obovate, convex, concentrically costated, truncated re-trally; lunette hemispherical, excavated; cartilage enclosed in a sulcus; margin toothed.—*Sower.* Min. Conch. t. ccxxxiii.—*Under Oolite.*

8. A. *planata.*—Transversely obovate, gibbose, with small obtuse concentric ridges; edges crenulated; lunette concave.—*Sower.* Min. Conch. t. cclvii.—In *Crag.*

9. A. *rugata.*—Obovate, anteriorly subtruncated, when young transversely costated, afterwards slightly wrinkled; edge internally crenulated; lunette concave, obovate, pointed.—*Sower.* Min. Conch. t. cccxi.—*London Clay.*

10. A. *obovata.*—Obovate, uniformly convex, corrugated; lunette compressed; anterior margin subtruncated, inner edge crenulated.—*Sower.* Min. Conch. t. cccliii.—*Iron Sand.*

11. A. *trigonalis.*—Cordato-triangular, depressed, transversely sulcated; beak pointed; anterior side separated by an angle, smooth.—*Sower.* Min. Conch. t. ccccxliv. f. 1.—*Inferior Oolite.*

12. A. *orbicularis.*—Lenticular, with many concentric reflected lamellæ upon its surface; edge smooth.—*Sower.* Min. Conch. t. ccccxliv. f. 2, 3.—*Upper Oolite.*

13. A. *pumila.*—Obliquely obovate, slightly convex, with numerous concentric ridges; edge crenated within.—*Sower.* Min. Conch. t. cccxliv. f. 4. 5, 6.—*Upper Oolite.*

14. A. *striata.*—Lenticular, transversely striated; lunette ovate, flat, deeply sunk, shell thick.—*Sower.* Min. Conch. t. DXX. f. 1.—*Green Sand.*

15. A. *orbicularis.*—Lenticular, rather gibbose, concentrically furrowed; furrows small; posterior surface plaited with an angle at its edge, lunette elongated, very deep.—*Sower.* Min. Conch. t. DXX. f. 2.—*Oolite.*

16. A. *imbricata.*—Cordate, orbicular, largely imbricated, convex; tooth in the left valve beneath the lunette small; lunette elongated, flat; hinge line arched; edge finely crenulated.—*Sower.* Min. Conch. t. DXXI. f. 1.—Suffolk, *Crag.*

17. A. *nitida.*—Transversely obovate, angular above, rather depressed, minutely sulcated near the beaks, the rest even; beaks pointed; lunette lanceolate; edge crenated.—*Sower.* Min. Conch. t. DXXI. f. 2.—Suffolk, *Crag.*

18. A. *bipartita.*—Obcordate, gibbose; six or eight large undulations upon a flat space near the beak, the rest of the surface even; beaks acute; edge toothed.—*Sower.* Min. Conch. t. DXXI. f. 3.—Suffolk, *Crag.*

19. A. *oblonga.*—Transversely oblong, convex; surface largely waved; beaks small; lunette cordate, pointed, concave; edge crenated.—*Sower.* Min. Conch. t. DXXI. f. 4.—Suffolk, *Crag.*

GEN. CXXIV. LUCINA.—Orbicular, two teeth in each valve, with lateral teeth.

* *Striæ concentric.*

504. L. *radula.*—Shell with numerous raised striæ, and shallow, broad, intervening spaces.

Pectunculus subfuscus, *List.* Conch. t. ccxciii.—Tellina radula, *Mont.* Test. Brit. 68. t. ii. f. 1, 2.—Venus borealis, *Don.* Brit. Shells, t. cxxx. —L. radula, *Turt.* Biv. Brit. 116.—Deep water on various parts of the coast.

Diameter about an inch and a half; white; lenticular, the margin slightly irregular retrally; beak prominent, slightly inclining; the concentric striæ in the young shell are very regular (in which state it appears to be the *L. alba* of Dr Turton, Biv. Brit. 114. t. vii. f. 6, 7.), but with age they become irregular, and less distinct towards the margin; one of the hinge teeth cloven; right valve with an anterior lateral tooth.

505. L. *flexuosa.*—Obsoletely striated transversely; the beaks prominent, and the retral margin much waved.

Tellina flexuosa, *Mont.* Test. Brit. 72.—Cryptodon flexuosus, *Turt.* Biv. Brit. 121. t. vii. f. 9, 10.—Not uncommon from Devon to Zetland.

Diameter scarcely half an inch; white, thin and translucent; two grooves on the retral extremity, extending from the beaks to the margin, and a rounded depression before the beaks; the teeth are indistinct, seldom more than one tooth developed in each valve. It bears a very close resemblance to *L. pennsylvanica*, List. Conch. t. cccv.

** *Striæ oblique and arched* (Strigella of Turton).

506. L. *carnaria.*—Oval, inequilateral, with oblique striæ in three directions, forming acute angles retrally, and waved arches anteally.

Pectunculus tenuis, *List.* Conch. t. cccxxxix.—Tellina carnaria, *Linn.* Syst. i. 1119.—*Pult.* Dorset. xxx.—*Don.* Brit. Shells, t. xlvii.—*Mont.* Test. Brit. 73.—Strigilla carnaria, *Turt.* Biv. Brit. 117.—Weymouth and Poole, *Dr Pulteney.*

Diameter about ¾ths of an inch; white, more or less tinged with rose-colour, back a little inclining, under which is an oval impression.

507. L. *pisiformis.*—Shell somewhat globular, and nearly equilateral, with oblique longitudinal striæ on one side, forming acute angles, on the other waved.

Tellina pisiformis, *Linn.* Syst. i. 1120.—Cardium discors, *Mont.* Test. Brit. 84.—Strigilla pisiformis, *Turt.* Biv. Brit. 119.—One dead specimen found at Falmouth by Mr Montagu.

Diameter about a quarter of an inch; convex, glossy white; beaks small, inclining; two teeth in one valve, one of which is very small, one in the other, with remote lateral teeth like laminæ. The *Strigilla divaricata* of "Bivalvia Britannica," appears to belong to this species. "Shell half an inch in diameter, white, thin, brittle, orbicular, with a slight flexuosity on the hinder side, rather convex, with regular but not very close striæ, which form rather oblique curved lines, and turn off at both the sides nearly in right angles; beaks central, very prominent; hinge with a single cloven tooth in one valve, closing between two plain ones in the other; the lateral teeth remote and small." Shores of Teignmouth.

508. L. *arcuata.*—Orbicular, with oblique doubly waved striæ.

Cardium ar. *Mont.* Test. Brit. 85. t, 3. f. 2.—Falmouth harbour.

Diameter about half an inch; white, thin, fragile, finely and regularly striated obliquely, with a few irregular concentric furrows; beak central, pointed and arching; hinge with one primary tooth in each valve, lateral teeth remote.

EXTINCT SPECIES.

1. L. *divaricatula.*—Orbicular, gibbose, marked with two sets of oblique arched striæ, and three or four deep lines of growth.—*Sower.* Min. Conch. t. ccccxvii.—*London Clay.*—Lamark and Sowerby agree in considering it as identical with the recent *L. divaricata* of the West Indies!

2. L. *mitis.*—Orbicular, convex, ornamented with minute longitudinal striæ, and numerous small regular concentric laminæ; lunette oval, very concave; cardinal teeth obscure, no lateral tooth.—*Sower.* Min. Conch. t. DLVII. —*London Clay.*

3. L. *antiquata.*—Orbicular, convex, ornamented with concentric laminæ; surface irregular; anterior side angular; lunette flat, lanceolate.—*Sower.* Min. Conch. t. DLVII. f. 2.—In *Crag.*

4. L. *crassa.*—Nearly orbicular, convex; covered with thick slightly elevated concentric laminæ; superior margin obtuse; lunette linear; concealed; valve thick.—*Sower.* Min. Conch. t. DLVII. f. 3.—*Oolite.*

GEN. CXXV. MYRTEA.—" Oval-triangular, equivalve, nearly equilateral, closed; hinge of one valve, with a single tooth and lateral one each side; of the other valve, two teeth, the lateral ones obscure."—*Turton.*

509. M. *spinifera.*—Shell with about thirty-six regular, concentric, elevated, and somewhat reflected, ridges.

Venus spin. *Mont.* Test. Brit. 577. t. xvii. f. i.—M. spin. *Turt.* Biv. Brit. 133.—Western coasts of England, rare.

Length half an inch, breadth a little more; yellowish-white; the ridges become confluent in pairs on the retral edge, forming short obtuse reflected spines; beaks small, nearly central, inclining, below which is a lanceolate depression.

VENERIDÆ.

GEN. CXXVI. CYPRINA.—Shell subcordiform, nearly equilateral, closed, hinge with three diverging teeth, and a remote lateral one at the retral termination of the ligament; syphons not produced, leaving the marginal impression of the cloak entire, resembling, in this character, the genus *Astarte.*

510. C. *islandica.*—Obliquely heart-shaped, beaks prominent, concentrically striated, and covered with a thick brown cuticle.

Concha e maximis, *List.* An. Ang. 173. Conch. t. cclxxii.—Venus isl. *Linn.* Syst. i. 1131. *Mull.* Zool. Dan. t. xxviii. f. 1–5. *Mont.* Test.

Brit. 114.—C. isl. *Turt.* Biv. Brit. 135.—Not uncommon on all parts of the coast.

This is the largest British bivalve shell, measuring sometimes 13 inches in circumference, and, exclusively of the animal, weighing upwards of 9 ounces; it is slightly truncated retrally; the ligament at the beak is lodged in a deep cavity; there is no lunette in front of the beaks. At St Andrew's it is called *Daikie*, and in Zetland *Cuvie.*

511. C. *triangularis.*—Subtriangular, smooth, with a lengthened cordiform depression in front of the beaks.

Venus tri. *Mont.* Test. Brit. 577. t. xvii. f. 3.—C. tri. *Turt.* Biv. Brit. 136. t. xi. f. 19, 20.—South of England and Dublin bay.

Diameter about half an inch; yellowish-white; strong, with a few obsolete concentric ridges; the beaks are produced, and the slope is nearly equal on both sides; in one valve two teeth, and a curved lateral one, in the other three teeth and a curved lateral one.

512. C. *minima.* — Suborbicular, compressed, with broad, smooth, transverse ribs.

Venus min. *Mont.* Test. Brit. 121. t. iii. f. 3.—C. min. *Turt.* Biv. Brit. 137.—Southern coasts of England.

Length a quarter of an inch, breadth rather more; flesh-coloured, with two red spots near the beaks, and two near the margin, connected by two white lines; glossy, strong. Dr Turton assigns to this species only two hinge teeth besides the lateral ones.

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EXTINCT SPECIES.

1. C. *æqualis.*—Uniformly convex, obcordate, or nearly circular, covered with numerous transverse concentric striæ; thick, particularly in the middle; margin acute, extended, entire; cicatrix obscure.—Venus equalis, *Sower.* Min. Conch. t. xxi.—In *Crag.*

2. C. *angulata.*—Obtusely cordate, broader than long, beak short angular, rising on the posterior side, which is slightly truncated, smooth; margin entire; larger hinge-teeth placed at an angle of about 60°.—Venus ang. *Sower.* Min. Conch. t. lxv.—In *Green Sand.*

3. C. *rustica.*—Suborbicular, gibbose, smooth; posterior side obscurely defined, convex, with a thick lateral tooth.—Venus rustica, *Sower.* Min. Conch. t. cxcvi.—In *Crag.*

GEN. CXXVII. CYTHEREA.—Shell suborbicular or transverse, unequilateral; hinge, on the right valve, of three diverging teeth and one transverse and detached at the side under the lunule; three diverging teeth in the other valve, with an adjacent transverse cavity anteriorly; syphon marks distinct.

513. C. *chione.*—Shell ovately-subtrigonal, smooth, glossy, with slight concentric lines of growth; a lanceolate lunule raised in the middle.

Venus Ch. *Linn.* Test. i. 1131. *Don.* Brit. Shells, t. xvii. *Mont.* Test. Brit. 115.—C. Ch. *Turt.* Biv. Brit. 161. t. viii. f. 11.—Southern coasts of England; where the shells are called *Queens.*

Length about 3 inches, breadth 4; cuticle chesnut, with darker bands; beaks incurved, little elevated and inclined; edge obtuse.

514. C. *Guineensis.*—Subcordate, with numerous close regular sharp ridges.

Pectunculus ruber, *List.* Conch. t. 306.—Venus Guin. *Mont.* Test. Brit. Sup. 48.—C. Guin. *Turt.* Biv. Brit. 161.—At Weymouth, *Mr Bryer*, and at Dunbar, *Mr Laskey.*

Length an inch and a quarter, breadth one inch and a half; white, with purple rays; the heart-shaped lunule and cartilage depression purple; slightly truncated retrally.

515. C. *exoleta.*—Shell suborbicular, nearly equilateral, distinctly striated transversely.

Pectunculus dense fasciatus, *List.* Conch. t. ccxci.—Venus exoleta, *Linn.* Syst. i. 1134. *Penn.* Brit. Zool. iv. 94. t. lix. f. 49. *Don.* Brit. Shells. t. xlii. f. 1. *Mont.* Test. Brit. 116.—C. ex. *Turt.* Biv. Brit. 162. t. viii. f. 7.—Sandy bays, in deep water.

Diameter about two inches; brownish white with dark zig-zag stripes; compressed; the ridges are sharp on the umbonal edge, and broader than the intervening striæ; syphon margin slightly truncated.

516. C. *lincta.*—Suborbicular, oblique, inequilateral, with fine concentric striæ.

Pectunculus, rostro productiore, *List.* Conch. t. ccxc.—Venus exoleta, var. *Penn.* Brit. Zool. iv. 95. t. lvi. f. 49.—V. lincta, *Pult.* Dorset. 34. V. exol. *Maton* and *Rackett*, Linn. Trans. viii. 87, t. iii. f. 2.—C. sinuata, *Turt.* Biv. Brit. 163. t. x. f. 10.—Sandy bays in deep water.

Length an inch and a half, breadth about one-tenth less; glossy white. It is chiefly distinguished from the preceding by the greater prominence of the beaks, by the cartilage slope being longer and less rounded; and, above all, by the striæ being more numerous, and the intervening ridges flatter on the corresponding parts. By Montagu it was considered as the young of *C. exoleta.*

517. C. *tigerina.*—Suborbicular, compressed, with numerous longitudinal striæ crossed by finer lines of growth.

Pectunculus magnus, *List.* Conch. t. cccxxxvii.—Venus tigerina, *Linn.* Syst. i. 1133. *Pult.* Dorset. 24. *Mont.* Test. Brit. 119. t. iv. f. 1.—C. tigerina, *Turt.* Biv. Brit. 164. t. x. f. 12.—English shores.

Diameter about an inch; white, with a crimson tinge; dorsal edge slightly depressed, with the beaks small and prominent, the ventral edge rounded.

518. C. *ovata.*—Subtriangular, with longitudinal ribs, rendered scaly by transverse striæ; no impression at the cartilage.

Pectunculus parvus, *List.* Conch. t. cccxi.—Venus ovata, *Penn.* Brit. Zool. iv. 97. t. lvi. f. 56.—Cardium striatum, *Walk.* Test. Min. 23. t. iii. f. 82.—V. ovata, *Mont.* Test. Brit. 120. *Turt.* Biv. Brit. 150.—On various parts of the coast from Devon to Zetland.

Length $\frac{3}{8}$ths, breadth $\frac{4}{8}$ths of an inch; brownish white; towards the middle the ribs have intermediate striæ; an obscure cordiform depression, raised in the middle before the beaks.

519. C. *orbiculata.*—Orbicular, compressed and cancellated; beaks small, with a minute cordiform impression in front.

Venus orb. *Mont.* Test. Brit. Sup. 42. t. xxix. f. 7.—Cyprina orbiculata, *Turt.* Biv. Brit. 138.—Dunbar, *Mr Laskey.*

Diameter $\frac{3}{8}$ths of an inch; white; margin plain; two approximating teeth, and one transverse, and rather remote where the margin is angular.

EXTINCT SPECIES.

1. C. *lentiformis.*—Orbicular, depressed, with concentric, reflected, minute, imbricated ridges; posterior slope depressed, terminated by an angle at the margin.—Venus exoleta, *Park.* Org. Rem. iii. 189. V. lent. *Sower.* Min. Conch. t. cciii.—*Crag.*

2. C. *scutellaria.*—*Mant.* Geol. 263. t. xxv. f. 2.—*Plastic Clay.*

GEN. CXXVIII. VENUS.—Shell suborbicular, inequilateral; hinge with three diverging teeth in each valve, the middle one in the left valve strong and bifid.

* *Margin within crenulated.*

520. V. *verrucosa.*—Shell tumid, heart-shaped, with numerous concentric ridges, broken into tubercles by longitudinal grooves at both extremities.

Pectunculus omnium, crassissimus, *List.* Conch. t. cclxxxiv.—Concha cinerea, *Borl.* Corn. 275. t. xxvii. f. 32.—V. ver. *Linn.* Syst. i. 1130.—V. erycina, *Penn.* Brit. Zool. iv. 94. t. liv. f. 48.—V. ver. *Don.* Brit. Shells, t. xliv. *Mont.* Test. Brit. 112. *Turt.* Biv. Brit. 140.—English and Irish shores.

Length two inches and a quarter, breadth a little more; rufous; strong; depression before the beaks heart-shaped, the posterior, or cartilage depression, distinctly displayed only on the left valve; the ridges are sharp, reflected and striated, and, towards the beaks the furrows are striated longitudinally; the margin crenulated within.

521. V. *cassina.*—Shell slightly compressed and heart-shaped, with numerous concentric entire ridges.

Linn. Syst. i. 1130.—V. erycina worn, *Penn.* Brit. Zool. iv. t. liv. f. 48. A.—V. lactea, *Don.* Brit. Shells, t. cxlix.—V. cass. *Maton* and *Rackett*, Lin. Trans. viii. 79. t. ii. f. 1. *Turt.* Biv. Brit. 141. t. ix. f. 1.—Various parts of the coast.

Diameter about two inches; whitish; ridges irregular in size, curving towards the hinge; left valve at the ligament depressed and striate; margin sometimes very obtuse.—This species is distinguished from the preceding by being less tumid, and by the ridges being entire.

522. V. *reflexa.*—Shell compressed, dorsal margin behind the beaks nearly straight; concentric ridges rising into thin plates retrally, where they are waved and deflected.

Laskey, Wern. Mem. i. 384. t. viii. f. 1. *Mont.* Test. Brit. Sup. 40. *Flem.* Encyc. Edin. vii. 95. t. ccvi. f. 1. *Turt.* Biv. Brit. 142. t. x. f. 1, 2.—Various parts of the coast from Devon to Zetland.

Diameter sometimes reaching two inches and a half; brownish or yellowish white, with faint red rays. It is much more compressed than either of the preceding, especially towards the ventral margin, and the depressed space at the ligament more distinctly marked on the right valve.

523. V. *fasciata.*—Compressed, with remote rounded smooth transverse ribs.

V. paphia, Pult. Dorset. 33. *Mont.* Test. Brit. 110.—V. fasc. *Don.* Brit. Shells, v. 170. *Turt.* Biv. Brit. 146. t. viii. f. 9.—Not uncommon from Devon to Zetland.

Diameter about an inch; colour reddish, with darker rays; beaks prominent; depression before the beaks much raised in the middle; dorsal margin behind the beaks sloping rapidly; ridges sometimes divided into groups by distant deeper furrows.—This species has been frequently confounded with V. Paphia of Linnæus, a West Indian shell, from which, however, as has been well observed by Donovan, it differs in the structure of the concentric ridges, which, in V. Paphia, " are remarkably thick and prominent in the middle, but in approaching each extremity, become suddenly obtuse, and are then continued in an attenuated ridge."

524. V. *cancellata.*—Shell round, heart-shaped, angular on the posterior side, with remote transverse plates, which are closely cancellated, and the impression before the beaks heart-shaped.

Linn. Syst. i. 1130. *Turt.* Biv. Brit. 144. t. x. f. 3.—Shores of Guernsea.

Diameter about half an inch; white, with sometimes a rosy tinge; beaks prominent; ridges nine or ten, remote, membranaceous, slightly tubercled posteriorly, the interstices with close set rib-like longitudinal ridges.

525. V. *subcordata.*—Subcordate, slightly truncated anteally; with strong longitudinal costated striæ, and remote transverse ridges.

Mont. Test. Brit. 121. t. iii. f. 1. *Turt.* Biv. Brit. 144.—Found by Montagu in sand from Falmouth Harbour.

Diameter a quarter of an inch; white, strong; the decussations are long squares; the beaks turning inwards, and much incurvated; cartilage margin smooth, sloping rapidly.

526. V. *granulata.*—Shell suborbicular, granularly reticulated, by the longitudinal ribs being crossed by rather shallow concentric grooves.

Don. Brit. Shells, t. lxxxiii. *Mont.* Test. Brit. 122. *Turt.* Biv. Brit. 144.—Shores of Devon and Cornwall and Frith of Forth.

Length ⅞ths of an inch, breadth 1 inch; thick; white, with purple blotches; beaks prominent.

527. V. *Dysera.*—Subtriangularly heart-shaped, remote concentric ridges, with longitudinal striæ in the interstices and slightly marking the ridges.

Pectunculus maculatus, *List.* Conch. t. cclxxvii.—V. Dys. *Linn.* Syst. i. 1130. *Mont.* Test. Brit. Sup. 42. *Turt.* Biv. Brit. 147. t. ix. f. 4.—Frith of Forth, Mr Laskey.—Shores of Guernsey, Dr Turton.

Diameter about an inch; white, variously marked with brown; ridges about twelve in number; beak small, inclining with a depression at both extremities.

528. V. *rugosa*.—Subtriangularly heart-shaped, with numerous concentric sharp ridges.

Penn. Brit. Zool. iv. t. lvi. f. 50.—V. cancellata, *Don.* Brit. Shells, t. cxv. —V. laminosa, *Laskey*, Wern. Mem. i. 384. t. viii. f. 16.—*Mont.* Test. Brit. Sup. 38.—*Turt.* Biv. Brit. 148. t. x. f. 4.—Various parts of the coast.

Length about an inch, breadth an inch and a quarter; colour white, tinged with brown; the margin of the ridges thin, slightly waved, and faintly striated on the distal side.

529. V. *Gallina*.—Subtriangularly heart-shaped, with numerous glossy, transverse, rounded ridges, with sharp reflected edges.

Pectunculus fuscus, *List.* Conch. t. cclxxxii.—V. Gal. *Linn.* Syst. i. 1130. —V. rugosa, var. *Penn.* Brit. Zool. iv. 95.—Venus striatula, *Don.* Brit. Shells, t. lxviii. *Mont.* Test. Brit. 113.—V. Gal. *Turt.* Biv. Brit. 149. t. ix. f. 2.—Sandy shores, common.

Diameter about an inch; yellowish-brown, with two or three pale rays, and numerous zig-zag streaks; the ridges are sloping externally, with the proximal edge low and sharp. It differs from the preceding, besides the form of the ridges, in being more tumid, the cartilage slope not so straight, and the depression in front of the beaks not so much produced.

530. V. *pallida*.—Triangularly heart-shaped; slightly produced retrally, with obscure transverse parallel ribs crossed by fine close longitudinal lines.

Turt. Biv. Brit. 150. t. x. f. 5.—Found at Dowlish.

Length about an inch, breadth nearly two; thin, semitransparent; yellowish-white; beaks prominent, pointed, the slopes on each extremity smooth; margin thin.

** *Margin plain.*

531. V. *undata*.—Orbicular, convex, irregularly striated concentrically, margin thin.

Penn. Brit. Zool. iv. 95. t. lv. f. 51. *Mont.* Test. Brit. 117.—T. Lucina rotundata, *Turt.* Biv. Brit. 115.—Sandy shores, common.

Diameter upwards of an inch; yellowish-white, thin, with one or two obsolete waves from the beak to the margin on the retral side; a very small depression in front of the beaks, which are prominent and inclining; the third or posterior tooth of the right valve very small.

532. V. *substriata*.—Transversely ovate, concentrically wrinkled, with obsolete undulated longitudinal striæ.

Mont. Test. Brit. Sup. 48. t. xxix. f. 6. *Turt.* Biv. Brit. 151.—Frith of Forth, *Mr Laskey.*

Length half an inch, breadth a little more; white, subpellucid; beak small, placed near to one side; hinge with three teeth, the two anterior ones short, the posterior one long and oblique, forming a cavity between it and the margin, for the reception of the cartilage.

533. V. *subrhomboidea*.—Subrhomboidal, rounded anteally, truncated retrally, and irregularly wrinkled concentrically.

Mont. Test. Brit. Sup. 49.—Crassina sub. *Turt.* Biv. Brit. 120.—Frith of Forth, *Mr Laskey.*

Length half an inch, breadth three quarters; white, with a rufous tinge; finely striated longitudinally; beaks small, nearly central; in each valve are two strong plain teeth, and a smooth long posterior one under the cartilage.

534. V. *sinuosa.*—Suborbicular, with a longitudinal sinuosity from the beaks, flat transverse striæ and obscure longitudinal ones.

Penn. Brit. Zool. iv. 95. t. lv. f. 51. A. *Don.* Brit. Shells, t. xlii. f. 2. *Mont.* Test. Brit. 120. *Turt.* Biv. Brit. 154. t. x. f. 9.—English and Irish shores.

Diameter ⅝ths of an inch; rounded at both sides; beaks nearly central, with a heart-shaped slightly carinate impression in front; inside rich yellow, in one valve two of the teeth are cloven, and one in the other.

V. 535. *aurea.*—Transversely ovate, tumid in the middle, and sloping to each side, with numerous concentric striæ, and obsolete longitudinal ones.

Tellina fasciata, *List.* Conch. cccciv. f. 249.—V. nebulosa, *Pult.* Dorset, 34.—V. aurea, *Mont.* Test. Brit. 129. *Turt.* Biv. Brit. 154. t. ix. f. 7, 8.—South of England and Ireland.

Length about an inch; breadth an inch and a quarter; yellowish-white, with brownish zig-zag lines; retral extremity slightly truncated obliquely; shell at the margin of the cartilage tumid; a broad lanceolate impression before the beaks.

536. V. *ænea.* — Oval, taper, and elongated retrally, with crowded transverse striæ and obscure longitudinal ones; two of the teeth cloven.

Turt. Biv. Brit. 152. t. x. f. 7.—Dublin Bay.

" Shell an inch long, and an inch and a half broad, white, covered with a shining bronzed skin, oval, convex, rounded at one end, regularly tapering, and much produced at the other, without forming any angle; with regular close set transverse striæ, and minute longitudinal lines; beaks much pointed, curved near the larger end with an elongated areola under them; teeth strong, two of them cloven in one valve, and one in the other."

537. V. *nitens.*—" Shell rhombic-oval, tumid in the middle, with crowded transverse striæ and obscure longitudinal ones, and the middle tooth cloven."

Turt. Biv. Brit. 157. t. x. f. 8.—Dublin Bay.

" Shell hardly three quarters of an inch long, and a little more in breadth, resembling the *V. aurea* in its outline; but there is an evident angle at the posterior side, and the colour is transparent horny, with some few scattered longitudinal marks. From *V. (Venerupis) virginea*, it differs in having obscure longitudinal lines, in the transverse striæ not becoming broader at the posterior end, and in having only one of the teeth cloven." It is probable that this and the preceding are merely varieties of *V. aurea.*

* * *

EXTINCT SPECIES.

1. V. *lineolata.*—Rather gibbous, ovato-subcordate; four-fifths of the surface covered with obscure zig-zag striæ; posterior side smooth; edge entire. —*V. castrensis*, *Park.* Org. Rem. iii. 187.—*V. lin. Sower.* Min. Conch. t. xx., upper figures.—*Green Sand.*

2. V. *plana.*—Rather depressed, subcordate, slightly angular towards the posterior side; surface smooth; edge entire.—*Sower.* Min. Conch. t. xx., lower figures.—*Green Sand.*

3. V. *incrassata.*—Orbicular, oblique, subdepressed, smooth; posterior slope straightish; lunule large, obscure; edge entire; a conical tooth under the lunule.—*Sower.* Min. Conch. t. clv. f. 1, 2.—*London Clay.*

4. V. *gibbosa.*—Orbicular, gibbous, with many transverse rugæ; lunule large and short; edge subcrenulated; hinge rather large.—*Sower.* Min. Conch. t. clv. f. 3, 4.—*Crag.*

5. V. *turgida.*—Orbicular, gibbose, with concentric ridges; valves thick, with tumid crenulated edges.—*Sower.* Min. Conch. t. cclvi.—*Crag.*

6. V. *varicosa.*—Subglobose, with projecting beaks, transversely furrowed, two longitudinal varicose ridges within each valve. An obscure cast.—*Sower.* Min. Conch. t. ccxcvi. f. 1, 2.—*Oolite.*

7. V. *transversa.*—Transversely ovate, elongated, gibbose; nearly smooth; anterior side small, rather pointed; shell thin.—*Sower.* Min. Conch. t. ccccxxxii. f. 1.—*London Clay.*

8. V. *rotundata.*—Obovate, gibbose; marked with numerous, minute, transverse striæ.—(*Brander*, f. 91.)—*V. lineolata*, *Sower.* Min. Conch. t. ccccxxii. f. 2.—*London Clay.*

9. V. *elegans.*—Ovate, convex, transversely sulcated; lunette ovate; the spaces between the sulci rounded and shining.—(*V. gallina*, *Brander*, f. 90.)—*Sower.* Min. Conch. t. ccccxxii. f. 3.—*London Clay.*

10. V. *pectinifera.*—Transversely oblong; carinated; surface longitudinally sulcated, and supporting a few erect lamellæ, commencing at the keel; posterior side smooth, truncated.—*Sower.* Min. Conch. t. ccccxxii. f. 4.—*London Clay.*

11. V. *caperata.*—Orbicular, rather depressed, covered with small, rounded concentric ridges; lunette cordiform, inconspicuous.—*Sower.* Min. Conch. t. dxviii. f. 1.—*Green Sand.*

12. V. *parva.*—Transversely obovate, rather convex, smooth; lunette narrow.—*Sower.* Min. Conch. t. dxviii. f. 4, 5, 6.—*Green Sand.*

13. V. *ovalis.*—*Sower.* Min. Conch. t. dlxvii. f. 12.

14. V. *Faba.*— 3.

15. V. *Ringmeriensis.*—Suborbicular, with numerous, transverse concentric striæ, beaks incurved, approximate; margin entire. A cast.—*Mant.* Geol. 126. t. xxv. f. 5.—*Grey Chalk Marl.*

Mr Sowerby has described two shells connected with this group, under a Genus which he terms Thetis, with the following character: "An equivalved, subequilateral bivalve; more or less orbicular, and convex; ligament marginal; three or four small acuminated teeth about the hinge; the line of attachment of the mantle? has a deep sinus extending nearly to the beak; muscular impressions rounded, small, distant from the hinge."

16. *Thetis major.*—Convex, orbicular; posterior edge rather angular; beaks small.—*Sower.* Min. Conch. t. dxiii. f. 1-4.—*Green Sand.*

17. *Thetis minor.*—Gibbose, wider than long; posterior edge rounded. Venus, No. 12.—*Mant.* Geol. Suss. 73.—*Sower.* Min. Conch. t. dxiii. f. 5, 6.—In *Green Sand.*

GEN. CXXIX. VENERUPIS. — Transverse, anterior side short; teeth three, erect, approximate and parallel; syphon impression large.

538. V. *perforans.*—Shell subrhomboidal, concentric striæ, forming ridges retrally, and crossed by fine longitudinal ones; teeth slender, and slightly recurved.

Venus per. *Mont.* Test. Brit. 127.—Venerupis per. *Turt.* Turt. Biv. Brit. 29.—Lodged in Limestone.

Length about an inch; breadth two inches and a half; white or brownish, with ziz-zag purple stripes, anteriorly short and truncate; dorsal and ventral margins nearly parallel; two of the teeth cloven; the syphon-mark broad, and adjacent to the marginal impression.

539. V. *Irus.*—Suboval, with elevated concentric reflected ridges, the interstices striated longitudinally.

Donax Irus, *Linn.* Syst. i. 1128. *Don.* Brit. Shells, t. xxix. *Mont.* Test. Brit. 108.—Petricola Irus. *Turt.* Biv. Brit. 26.—In Limestone Rocks, which it perforates.

Length half an inch, breadth three quarters; white, with a tinge of brown; variable in its outline, usually truncate anteally, and rounded retrally, with the dorsal and ventral margins nearly straight, and parallel; the ridges are distant; the syphons, according to Montagu, are long, slender, white, and pellucid, united to near the extremity, where the diverge become pink coloured, with openings ciliated with feathered fibres.

540. V. *pullastra.* — Transversely oblong with concentric striæ, becoming rough at the retral extremity, minutely striated longitudinally; syphon-mark broad, and parallel with the marginal impression.

Wood, Linn. Trans. vi. t. xvii. f. 13, 14.—Venus pull. *Mont.* Test. Brit. 125. *Turt.* Biv. Brit. 159.—In Clay, common.

Length an inch and a half, breadth two inches; white, tinged with brown or purple, especially at the retral extremity, where it is slightly truncated.

541. V. *decussata.* — Transversely oblong, with concentric and longitudinal striæ, becoming tubercular on the retral extremity; syphon-mark receding from the marginal impression towards the centre of the shell.

Concha quasi-rhomboides, *List.* An. Ang. 171. t. iv. f. 20. Conch. t. ccccxxiii.—Venus decuss. *Linn.* Syst. i. 1135.—V. littorata, *Penn.* Brit. Zool. iv. 96. t. lvii. f. 53. *Mont.* Test. Brit. 124. *Turt.* Biv. Brit. 158. t. viii. f. 10.—English Shores.

Length two, breadth three inches; principally distinguished from the preceding by superior size and strength, greater coarseness of striæ, a more distinct impression in front of the beaks; the position of the syphon-mark, and the syphons themselves, which are separate nearly to their origin in this, while they are connected almost their whole length in *V. pullastra*, furnish internal marks of difference, easily detected.

542. V. *virginea.*—Transversely oblong, with numerous smooth, flat, concentric ridges, with narrow intervening furrows.

Tellina lata, *List.* Conch. t. ccclxxxv.—Venus virginea, *Linn.* Syst. i. 1136.—V. rhomboides, *Penn.* Brit. Zool. iv. 97, t. lv.—V. vir. *Mont.* Test. Brit. 128. *Turt.* Biv. Brit. 156, t. viii. f. 8.—South coast of England, and west coast of Scotland.

Length 1$\frac{1}{2}$, breadth 2 inches; white with reddish markings; retral extremity more or less obliquely truncated with an obsolete angle from the beak to the outer edge; margin of the shell, at the cartilage, tumid; a lanceolate mark before the beaks; ventral margin obtuse.

543. V. *sarniensis.*—Transversely ovate, with smooth, regular transverse striæ.

Tellina fasciata, *List.* Conch. t. cccciii.—Venus sarn. *Turt.* Biv. Brit. 153, t. x. f. 8.—Guernsey and Zetland.

Length 2 inches, breadth a little more. It chiefly differs from the preceding, of which it may prove to be only a variety, in its more rounded and tumid form, the striæ not increasing retrally, and in the indistinctness of the anal angle.

EXTINCT SPECIES.

1. V. *laminosa.*—*Sower.* Min. Conch. t. dlxxiii.

CYCLADÆ.

GEN. CXXX. CYCLAS.—Orbicular, tumid, with two primary teeth in each valve, and a remote transverse lateral one on each side: the primary teeth sometimes bifid; generally minute and obscure; ovoviviparous.

544. C. *corneus.*—Equilateral, finely streaked concentrically; no impression in front of the beaks; ligament indistinct externally.

Musculus exiguus, *List.* An. Ang. 150, t. ii. f. 31.—Tellina cornea, *Linn.* Syst. 1. 1120.—Tellina rivalis, *Mull.* Verm. ii. 202.—T. cornea, *Penn.* Brit. Zool. iv. 89, t. xlix. f. 36.—Cardium corneum, *Mont.* Test. Brit. 86.—Cyclas rivalis, *Drap.* Moll. 129, t. x. f. 4, 5.—Cyclas cornea, *Lamark*, Hist. v. 558. *Turt.* Biv. Brit. 249, t. xi. f. 14.—In muddy pools.

Length $\frac{4}{10}$ths, breadth $\frac{5}{10}$ths of an inch; cuticle yellowish or olive, often dark, with a pale band; the outline slightly obtuse ventrally and retrally; irregularly furrowed by the stages of growth. There are three varieties of this species: 1. Compressed, nearly lenticular; 2. Gibbous at the beaks, but becoming thin or compressed towards the edges; 3. Nearly globular. The *C. pusilla* of authors seems to be the fry of this species.

545. C. *rivicola.*—Equilateral, finely streaked concentrically; a distinct oval impression in front of the beaks, and another

behind, with prominent edges for the cartilage, which is distinct.

Pectunculus subviridis, *List.* Conch. t. clix. f. 14.—Cyclas cornea, *Drap.* Moll. 128. t. x. f. 1, 2, 3.—Cyclas rivicola, *Lam.* Hist. v. 558.—*Turt.* Biv. Brit. 248, t. xi. f. 13.—Slow running streams, England.

Length $\frac{6}{10}$ths, breadth $\frac{7}{10}$ths of an inch; cuticle yellowish or olive; often darker, with pale bands; less tumid, and more regularly curved in the outline than the preceding, of which it was supposed to be only a large variety by Lister who had it from Doncaster, Linnæus from Iceland, and Montagu from the Thames. The transverse grooves and coloured bands of both species, depending on circumstances accelerating or retarding the growth of the animal, furnish characters of uncertain value, though generally employed by modern authors.

546. C. *lacustris.*—Subinequilateral, with minute concentric striæ; beaks prominent, with the margin in front thin and elevated.

Tellina lacustris, *Mull.* Hist. Verm. ii. 204.—Cardium lac. *Mont.* Test. Brit. 89.—Cyclas lac. *Drap.* Moll. 130, t. x. f. 6. 7.—*Turt.* Biv. Brit. 249, t. xi. f. 18.—In slow running streams, England.

Length $\frac{3}{10}$ths, breadth $\frac{4}{10}$ths of an inch; thin, glossy, transversely subrhomboidal; margin thin.

547. C. *amnicus.*—Inequilateral, transversely ovate, and sulcated concentrically.

Tellina amnica, *Mull.* Hist. Verm. ii. 205.—T. rivalis, *Maton*, Linn. Trans. iii. 44, t. xiii. f. 37, 38.—Cardium amnicum, *Mont.* Test. Brit. 86.—Cyclas palustris, *Drap.* Moll. 131, t. x. f. 17, 18.—C. amnica, *Turt.* Biv. Brit. 250, t. xi. f. 15.—In slow running streams.

Length about three-eighths, breadth half an inch; greenish; slightly produced anteally; the margin in front of the beaks prominent; the furrows of the sulci are finely striated.

EXTINCT SPECIES.

1. C. *deperditus.*—Ovato-transverse, rather gibbous, umbonate; lines of growth elevated, irregular; central hinge teeth three, lateral ones two.—*Sower.* Min. Conch. t. clxii. f. 1.—*Plastic Clay.*

2. C. *cuneiformis.*—Transversely cuneate-ovate, gibbous; lines of growth numerous, fine; central hinge teeth three; lateral ones two.—C. deperdita, *Park.* Org. Rem. 111. 189, t. xiii. f. 5.—C. cun. *Sower.* Min. Conch. t. clxii. f. 2, 3.—*Plastic Clay.*

3. C. *obovatus.*—Obovate, gibbous, anterior side obtuse; beaks large; central hinge teeth three; lateral ones two.—*Sower.* Min. Conch. t. clxii. f. 4, 5, 6.—*Plastic Clay.*

4. C. *medius.*—Transversely obovate, depressed, thick, smooth, anterior (?) side small, posterior rather pointed; one tooth near the beaks in each valve. —Cyrena media, *Fitton*, Annals of Phil. Nov. 1824, 376. Cyclas medius, *Sower.* Min. Conch. t. DXXVII. f. 2.—*In the fresh water Formation between the Green and Iron Sand.*

5. C. *membranaceus.*—Transversely obovate, depressed, smooth, very thin; anterior side small, posterior rather pointed.—Cyrena memb. *Fitton*, Annals of Phil. Nov. 1824, 376. Cyclas memb. *Sower.* Min. Conch. t. DXXVII. f. 3. —*Weald Clay under Green Sand.*

GEN. CYRENA.—Suborbicular, with three primary teeth in each valve, and transverse lateral teeth; ligament on the longest side.

1. C. *pulchra.*—Suborbicular convex, smooth, slender; posteriorly truncated; one sharp-edged and two bifid teeth in each valve; lateral teeth plain and obtuse.—Cyclas pulcher, *Sower.* Min. Conch. t. DXXVII. f. 1.—Hampstead, Isle of Wight, Professor Sedgwick.

TEREDINADÆ.

GEN. CXXXI. TEREDO. SHIP WORM.—Shell orbicular, hemispherical, equivalve; hinge with a long curved tooth in each valve, inserted under the margin; ligament imperfect, the tube open at both extremities. Burrowing in wood.

* *The ear-shaped process on the inside of the valves, at the outer angle under the hinge, having the inner margin detached, and forming a straight transverse edge, and the outer margin much reflected.*

548. T. *bipinnata.*—Accessorial appendages long, linear, and feathered; an oblique rib on the margin above the teeth.

Turt. Conch. Dict. 184, t. xi. f. 38, 39, 40.; Biv. Brit. 15.—In drifted timber, Exmouth.

Diameter upwards of three quarters of an inch; tube simple; appendages about the tenth of an inch in diameter; silvery white, with numerous pearly tubercles, the outer half with verticillate, lanceolate, fringed filaments.—This is nearly allied to *T. palmulatus* of Lamarck.

549. T. *malleolus.*—Accessorial appendages transverse and mallet-shaped, with a slender point rising like a handle from the middle.

Turt. Biv. Brit. 255. t. 2. f. 19.—Drifted timber, Torbay.

Diameter about a quarter of an inch; striæ on the triangular processes remote; the tube consists of a slight testaceous deposit on the surface of the chamber, the termination of which is slightly semiconcamerated.

** *The ear-shaped process with the inner margin on the inside furnished with a rib only, and not a detached margin, and the outer edge is not reflected.*

550. T. *navalis.*—Accessorial appendages elongated and spoon-shaped.

Linn. Syst. i. 1267.—*Penn.* Brit. Zool. iv. 147. *Mont.* Test. Brit. 527. *Home*, Phil. Trans. 1826, 278. t. xii. f. 3. *Turt.* Biv. Brit. 14. t. ii. f. 1, 2, 3.—In timber exposed to the sea; the scourge of shipping.

Shell about three quarters of an inch in diameter, with the valves triangular, and forming a circular hemisphere when closed together, elegantly striate in various directions, each with a triangular projection in front bending a little inwards; syphons nearly divided to their origin at the junction of the accessorial appendages; the largest or branchial one has the inside of the orifice fringed with about twenty small tentacula; foot with a convex extremity; mouth round; gullet short, leaning to the left side of the neck; on the right side of the neck are two large glands; stomach of two distinct bags communicating at the lower extremity; the intestine begins close to the termination of the gullet, is small, dilates into a cavity, containing a hard, white globular body of the size of a large pin's head. In the intestine Sir E. Home found a yellow-coloured pulp, which Mr Hatchett, after examination, considered as " vegetable saw dust."

551. T. *nana.*—" Valves rounded and without auricles behind, a strong conic tooth on the margin above the teeth."

Turt. Biv. Brit. 16. t. 2. f. 6, 7.—Drifted wood in Torbay.

Diameter about an eighth of an inch; the conical tooth on the margin of the hinge pointing rather obliquely.

GEN. CXXXII. XYLOPHAGA.—Shell globular, oblique, equivalve, very open anteally, and closed retrally, furnished with accessorial valves about the hinge, which is destitute of long curved teeth under the margin.

552. X. *dorsalis.*—Shell rounded, with a triangular striated projection in front of the head of each, and a longitudinal rib on the inside.

Turt. Biv. Brit. 16. and 253, t. ii. f. 4, 5.—Drifted wood, Torbay.

Less than *Teredo navalis*; a mesial groove on the outside, corresponding with the jointed rib on the inside. There is no evidence of its possessing the lengthened calcareous syphons or tube, with their basal appendages, of the *Teredo.* It is probably nearly related to *Gastrochæna.*

GEN. FISTULANA.—Shell equivalve, gaping, with a dorsal plate over the hinge; tube closed at the inner end.

1. F. *personata.*—Valves transversely striated on the retral half; the fine striæ on the anteal half regularly and minutely toothed; dorsal plate thick, four-lobed, with rounded edges.—*Park.* Org. Rem. iii. 202, t. xiv. f. 10.—Teredo antenautæ, *Sower.* Min. Conch. t. cii.—Imbedded in the fossil wood of the *London Clay.*

GEN. CLAVAGELLA.—Tube open at the outer end, terminating at the inner claviform extremity in tubular processes; one of the valves cemented to the tube.

1. C. *coronata.*—Tube elongated, crowned with dichotomously branched tubes around a sulcated disk.—*Sower.* Min. Conch. t. cccclxxx.—*London Clay.*

PHOLADÆ.

GEN. CXXXIII. PHOLAS.—Shell transverse; ligament slender, and covered by a reflected fold of the cloak, and sometimes protected by calcareous plates; hinge with a curved process under the margin in each valve, receding into the cavity.

* *Valves divided by a longitudinal groove.*

553. P. *crispata.*—Transversely oblong, rounded, and gaping retrally, obliquely truncated, and open anteally.

P. latus, *List.* Conch. t. ccccxxxvi. An. Ang. 192. t. v. f. 38. Anat. t. xix. f. 3.—P. crisp. *Linn.* Syst. i. 1111. *Mont.* Test. Brit. 23. *Turt.* Biv. Brit. 6.—In calcareous and argillaceous rocks.

Length 2 inches, breadth 3; white; a groove runs from the hinge to the middle of the ventral margin, where the valves come in contact, dividing the shell into two compartments; the anterior is very rough, with numerous thin waved concentric ridges, with obsolete longitudinal furrows; the posterior is comparatively smooth; margin of the shell at the hinge reflected, smooth, covered by a fold of the cloak, and strengthened by an obscure imbedded calcareous plate; projecting tooth linear; foot or sucker large, the syphon tubes produced.

554. P. *lamellata.*—An erect triangular plate at the hinge, placed retrally with respect to the recurved tooth.

P. papyracea, *Turt.* Biv. Brit. 2. t. i. f. 1–4.—T. lamellata, *Ib.* 4. t. i. f. 5, 6.

Length half an inch, breadth an inch; white; anterior compartment with the waved ridges broken into thin denticular processes in bent longitudinal rows; posterior compartment comparatively smooth; the valves shut close retrally from the mesial furrow; behind the hinge, dorsally, the margin is closed, compressed, and prominent; before the hinge the margin is a little open, and reflected on each side into a thin, nearly erect, plate; the anteal extremity is obliquely truncated and open.—This is the condition of the shell when of a certain age (and constituting Dr Turton's *P. lamellata.*) It seems afterwards to change its form; the oblique truncated anteal aperture is filled by the deposition of shell nearly smooth, bringing the now tumid edges nearly in contact; retrally the shelly matter deposited, is broadest towards the extremity, now become truncated and a little open, to which is attached a coriaceous expanding cup, divided longitudinally, and thickened at the margin dorsally and ventrally; this seems destined to be a basal sheath for the syphons; anteally the margins approximate, and are thick and elevated before the hinge. The cloak is now closed, with only a small opening for the foot. In this last state, Dr Turton has described this shell as the *Pholas papyraceus* of Solander's *MSS*, and regards it as quite distinct from *P. lamellata.* A comparison, however, in reference to their mode of growth, of specimens of both shells, obligingly furnished to me by Mr G. B. Sowerby, has left no room for hesitating regarding their specific identity. The structure of the hinge, so different from the other species, and the singular changes of form, with age, would justify the erection of the genus *Pholadidia*, originally contemplated by Dr Goodall for its reception.

555. P. *tuberculatus.*—Shell open at the anterior end, with a rough tubercle on the margin above the teeth, and a single oval calcareous plate at the hinge extending to the anteal extremity.

Turt. Biv. Brit. v. t. i. f. 7, 8.—Torbay.

Length three-quarters of an inch, breadth an inch and a half; white; front of the shell slightly elongated into a beak; anterior compartment with rough ribs, which gradually disappear towards the retral truncated extremity.

556. P. *conoides.*—Transversely elongated, anteal division short, tumid, rounded, the retral division produced and subcompressed.

Parsons, Phil. Trans. 1765, i. t. 1.—P. striatus, *Linn.* Syst. i. 1111.—P. nanus, *Pult.* Dorset. 27.—P. stri. *Don.* Brit. Shells, t. cxvii. *Mont.* Test. Brit. 26. *Turt.* Biv. Brit. 11.—In ship planks.

Length half an inch, breadth an inch; ridges in the anteal compartment crowded, rough; in the retral wider and smoother, well marked along the furrow; nearly closed retrally; when young, very open anteally, and beaked, but filling up with smoother shell (like *P. papyracea*) towards maturity; one large rounded accessory plate over the hinge, behind which is a lengthened one, and a third connecting the ventral margins of the shells; a long slender curved tooth in each valve.

** *The valves not divided by a groove.*

557. P. *dactylus.* — Conically transverse, with concentric, waved, muricated ridges, having longitudinal grooves, most conspicuous anteally; margin above the beaks reflected, circular, with four accessory plates.

P. striatus, *List.* Conch. t. ccccxxxiii. Anat. t. xix. f. 1, 2.—P. dact. *Linn.* Syst. i. 1110. *Borl.* Corn. 278. t. xxviii.-xxxi. *Mont.* Test. Brit. 20. *Turt.* Biv. Brit. 8.—In rocks and submarine trees.

Length sometimes 2 inches, and breadth 7; wide and open before; slightly compressed behind; shell in front of the hinge produced into a kind of beak, with the edge thin and reflected.

558. P. *parvus.*—Shell open, and produced into a beak anteally, with a smooth tubercle on the margin above the teeth, and a single accessorial valve at the hinge.

Mont. Test. Brit. 22. t. i. f. 7, 8. *Turt.* Biv. Brit. 9.—Submarine wood on the south coast of England.

Length $\frac{3}{4}$ths, breadth $1\frac{1}{2}$ inches; transversely striated, with longitudinal ridges anteally; the anteal opening is oval, and the fold above the beaks destitute of cells. Montagu is inclined to consider this shell as the *P. parvus* of Pennant, (Brit. Zool. iv. 77. t. xl. f. 13.) though it is not improbable that it is related to the young of *P. papyracea.*

559. P. *candidus.*—Shell nearly closed anteally; a tooth-like process on the hinge ascending obliquely and retrally; margin above the hinge reflected, and covered with an elongated accessorial plate.

Concha candida, *List.* An. Ang. 193. t. v. f. 39. Conch. t. ccccxxxv.—P.

cand. *Linn.* Syst. i. 1111. *Mont.* Test. Brit. 24. *Turt.* Biv. Brit. 10. In clay rocks.

Length 1 inch, breadth 2½ inches; white, fragile, and rounded at both ends; concentrical ridge divided into longitudinal rows of short prickles.

EXTINCT SPECIES.

1. P. *cylindricus.*—Transversely elongated, nearly cylindrical; anterior side muricated, pointed, with a sinus in the edge; beaks concealed by a reflection of the edges of the back.—*Sower.* Min. Conch. t. cxcviii.—In *Crag.*

GEN. CXXXIV. GASTROCHÆNA.—Shell transverse, equivalve, inequilateral, with a large oblique anteal opening; hinge with a single transverse laminar tooth in each valve; ligament external, rather remote from the beaks.

560. G. *hians.*—Beaks nearly terminal, rather prominent.

Mya dubia, *Penn.* Brit. Zool. iv. 82. t. xliv. *Mont.* Test. Brit. 28.—G. pholadia, *Turt.* Biv. Brit. 18. t. ii. f. 8, 9.—In Limestone, near low water-mark, England.

Length half an inch, breadth an inch; finely striated concentrically; from the beak to the ligament the margin is nearly straight, then rounded retrally; the oblique anteal truncation extended beyond the middle of the ventral margin; a narrow border in front of the beaks, where the valves are in contact.

EXTINCT SPECIES.

1. G. *tortuosa.*—Obliquely lanceolate and twisted.—*Sower.* Min. Conch. t. DXXVI, f. 1.—In *Sandstone*, Robin Hood's Bay, near Scarborough.

2. G. *contorta.*—Sheath clavate, bent nearly at a right angle; valves ovate, elongated; marked with very slender striæ; the sinus between them wide, oval, pointed.—*Sower.* Min. Conch. t. DXXVI. f. 2.—*London Clay.*

SOLENIDÆ.

GEN. CXXXV. SOLEN.—Shell transversely produced, the dorsal and ventral margins nearly parallel; the extremities gaping; teeth projecting; cuticle strong.

* *Hinge terminal, the anteal extremity truncated.*

561. S. *Vagina.*—A single tooth in each valve, with a stricture across the anteal extremity of the shell.

List. Conch. t. MLVI. *Linn.* Syst. i. 1113. *Penn.* Brit. Zool. iv. 83. *Mont.* Test. Brit. 48. *Turt.* Biv. Brit. 79.—English and Irish coasts.

Length 1 inch, breadth 5 inches; subcylindrical, becoming more compressed towards the truncated retral extremity; the anteal extremity is slightly oblique, shortest dorsally; teeth flattened on the rubbing surface; the opposite sides strengthened by a rib; syphons connected; pale yellow, longitudinally striated, and annulated with brown, the openings fimbriated.

562. S. *novacula.*—A single strong, curved, blunt tooth in each valve; shell destitute of the terminal stricture.

Mont. Test. Brit. 47. *Turt.* Biv. Brit. 80.—English and Irish coasts.

Length 1 inch, breadth 8; nearly resembling the following, but differing in the number of teeth and the absence of the lateral teeth.

563. S. *Siliqua.*—Shell straight, two teeth in one valve, one in the other; with a tooth-like laminar marginal process behind each.

Concha fusca, *List.* An. Ang. 192. t. v. f. 37. Conch. t. ccccix.—S. sil. *Linn.* Syst. i. 1113. *Penn.* Brit. Zool. iv. 83. t. xlv. f. 20. *Mont.* Test. Brit. 46. *Turt.* Biv. Brit. 80.—On sandy shores, common.—*E*, Rasor fish; *S*, Spout fish.

Length upwards of an inch; breadth from seven to eight; cuticle olive-brown, darkest at the anteal extremity; the lateral teeth are remote, rising behind into an angular plate.—The animal is used as food, and considered as a delicacy; when a little stale, it forms a tempting bait for the cod and haddock. Dr Turton describes a shell under the title *S. ligula* (Biv. Brit. 82. t. vi. f. 6.) differing only from this species in the single tooth being "compressed, rounded, and obtuse at the top, where it is slightly cloven."

564. S. *Ensis.*—Shell a little recurved, two teeth in one valve, and one in the other; one of the lateral teeth grooved.

S. curvus, *List.* Conch. t. ccccxi.—S. ensis, *Linn.* Syst. i. 1114. *Penn.* Brit. Zool. iv. 83. *Mont.* Test. Brit. 48. *Turt.* Biv. Brit. 82.—Sandy shores, common.

Length $\frac{3}{4}$ths of an inch, breadth 6 inches, but usually much smaller; curvature of the shell regular; the lateral marginal teeth are low, with the left one recurving the opposite into a linear groove.

565. S. *purpureus.*—Obliquely truncate retrally, and irregularly striated transversely.

Mya purp. *Mont.* Test. Brit. Sup. 21.—Agina purp. *Turt.* Biv. Brit. 54. t. iv. f. 9.—In rocks, Torbay.

Length one-eighth of an inch, breadth a quarter; convex; opake, with a glossy cuticle, beaks prominent, nearly terminal; hinge, with a strong conic tooth in each valve, penetrating a cavity of the opposite valve.

** *Hinge not terminal, the anteal extremity rounded.*

566. S. *pellucidus.*—Dorsal margin nearly straight, ventral margin slightly curved.

Penn. Brit. Zool. iv. 84. t. xlvi. f. 22. *Mont.* Test. Brit. 49. *Turt.* Biv. Brit. 83.—In sandy bays.

Length a quarter, breadth upwards of an inch; pellucid, fragile; rounded at each end; the hinge is removed but a short way from the extremity, and consists of one tooth in one valve, and two teeth in the opposite with contiguous lateral processes.

567. S. *Legumen.*—Dorsal and ventral margins slightly rounded; compressed, and narrow retrally.

Chama subfusca, *List.* Conch. t. ccccxx.—S. l. *Linn.* Syst. i. 1114. *Penn.* Brit. Zool. iv. 84. t. xlvi. f. 24. *Mont.* Test. Brit. 50.—Psammobia legumen, *Turt.* Biv. Brit. 90.—South coast of England and Ireland.

Length ¾ths of an inch, breadth nearly 4 inches; thin, pellucid, fragile; finely striated by the lines of growth; hinge nearly in the middle, with one tooth in one valve, and two in the other, lateral teeth single in one valve, winged in the other; the hinge is strengthened by an oblique internal rib in each valve.

568. S. *antiquatus.*—Transversely oblong, extremities rounded; the dorsal margin slightly convex, the ventral slightly concave.

S. cultellus, *Penn.* Brit. Zool. iv. 85. t. xlvi. f. 25.—S. ant. *Pult.* Dorset. *Mont.* Test. Brit. 52.—Psammobia ant. *Turt.* Biv. Brit. 91.—English shores, rare.

Length about an inch, breadth two inches; thin, subpellucid, concentrically striated by the lines of growth, most conspicuous towards the extremities; hinge in the middle, one tooth in one valve (with sometimes the rudiments of a second), and two teeth in the other, behind which the margin is callous.

569. S. *declivis.*—Transversely oblong; extremities rounded; dorsal margin slightly convex; ventral margin straight.

Chama angustior, *List.* Conch. t. ccccxxi.—S. dec. *Turt.* Conch. Dict. 164. t. xxii. f. 80.—Scilly Islands.

Length three quarters of an inch, breadth two inches; thin, semitransparent, with a thick dark brown cuticle, irregularly and concentrically striated; beaks nearly central, sloping gradually to both extremities; a slight indentation behind the beaks; teeth strong, two on each valve, one of them concave; and in one valve one of them is oblique, behind which the margin is callous.

570. S. *fragilis.*—Transversely oblong, rounded at the extremities; a little contracted in the middle; dorsal and ventral margins nearly parallel.

Pult. Dorset. 28. *Mont.* Test. Brit. 51.—Psammobia tæniata, *Turt.* Biv. 85.—English and Irish coasts, rare.

Length half an inch, breadth nearly an inch; thin, transparent, smooth, with a greenish cuticle, sometimes marked with a longitudinal reddish stripe from the hinge to the ventral margin; beaks nearly central; in one valve two erect teeth, one of which is pointed, the other with one subulate tooth; a longitudinal rib internally.

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EXTINCT SPECIES.

1. S. *affinis.*—Shell linear, subarcuate, rounded at each extremity, hinge placed near one extremity, surface smooth. Nearly resembling S. pellucidus, *Sower.* Min. Conch. t. iii.—*London Clay.*

GEN. CXXXVI. SANGUINOLARIA.—Shell transversely oblong, dorsal and ventral margins not parallel; hinge with two projecting prominent teeth in each valve.

571. S. *vespertina.*—Compressed, concentrically striated; ventral extremity slightly angular.

Tellina depressa, *Penn.* Brit. Zool. iv. 87. t. xlvii. f. 27.—T. variabilis, *Don.* Brit. Shells, t. xli. f. 2.—S. vesp. *Mont.* Test. Brit. 54.—Psammobia vespertina, *Turt.* Biv. Brit. 92. t. vi. f. 10.—Southern coasts of England and Zetland.

Length an inch and a half, breadth 3 inches; opaque; cuticle dark-brown, with purplish longitudinal rays; striæ on the retral extremity coarse; a slight oblique fold from the beaks to the hinder extremity; one of the teeth in one valve thin, laminar, and oblique.

572. S. *deflorata.*—Valves convex, obsoletely truncated retrally, with numerous waved longitudinal striæ, crossed by the layers of growth.

Venus defl. *Linn.* Syst. i. 1133. *Penn.* Brit. Zool. iv. 96. t. lvii. f. 54. *Mont.* Test. Brit. 123. t. iii. f. 4.—Psammobia defl. *Turt.* Biv. Brit. 93. South coast of England, rare.

Length an inch, breadth an inch and three quarters; purplish; from the fold to the margin behind the cartilage, the longitudinal striæ are large and rough; two teeth in each valve, one of them small.

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EXTINCT SPECIES.

1. S. *Hollowayisii.*—Depressed, transversely elongate, ovate, and striated; posterior side gradually expanded; anterior side very small.—*Sower.* Min. Conch. t. clix.—*London Clay.*

2. S. *undulata.*—Three times as wide as long, transversely undulated; convex; anteriorly rounded, posteriorly subtruncate, gaping a little; beaks prominent.—*Sower.* Min. Conch. t. DXLVIII. f. 1, 2.—*Inferior Oolite.*

3. S. *gibbosa.*—Three times as wide as long, gibbose, smooth; sides rather acuminated, a little gaping.—*Sower.* Min. Conch. t. DXLVIII.—*Carboniferous Limestone,* Queen's County, Ireland.

GEN. CXXXVII. HIATELLA.—Transversely oblong; dorsal and ventral margins nearly parallel; hinge with the teeth obscure, or with one tooth in one valve received into a cavity in the other.

573. H. *rugosa.*—Rounded anteally, subtruncated retrally, with a slight constriction towards the middle of the ventral margin.

Pholas noster, *List.* An. Ang. 172. t. iv. f. 21.—Mytilus rugosus, *Linn.* Syst. i. 1156. *Mull.* Prod. 249. Zool. Dan. t. lxxxvii. f. 1, 2.—Mya byssifera, *Fab.* Green. 408.—Mytilus rugosus, *Penn.* Brit. Zool. iv. 110. t. lxiii. f. 72. *Mont.* Test. Brit. 164.—Saxicava rugosa and S. Pholadis, *Turt.* Biv. Brit. 20. t. ii. f. 10.—In cavities of limestone and the roots of fuci.

Length half an inch, breadth an inch and a half; white, with a greyish wrinkled cuticle; irregularly sulcated concentrically; the ridges most conspicuous on the angle from the beaks to the retral extremity; the animal employs a byssus, when not lodged in the cavity of a stone.

574. H. *arctica.*—Shell with two diverging spinous ridges from the hinge to the retral extremity.

Chamæ-pholas angusta, *List.* Conch. t. ccccxxvi.—Solen minutus, *Linn.* Syst. 1115.—Mya arctica, *Fab.* Fauna Groen. 407.—Curious Muskle. *Cordiner's* Ruins, Plate No. 24. f. A.—Solen minutus, *Mont.* Test. Brit. 53. t. i. f. 4.—Hiatella minuta, and H. oblonga, *Turt.* Biv. Brit. 24. t. ii. f. 12, 13.—Anatina arctica, ib. 49. t. iv. f. 7, 8.—Roots of fuci.

This species, when young, has the spinous ridges very distinct; and, when not imbedded in stone, it adheres by a byssus. When old, the spinous ridges disappear, and then in size, and other circumstances, it so exactly resembles the preceding, as to leave little room for suspecting a specific difference. The *Mytilus præcisus* of Montagu, (Test. Brit. 165. t. iv. f. 2.) seems to be a variety in which the anterior end is truncated, and very short, and the beaks elevated; while the *M. plicatus* of the same author only differs in the beaks being small and slightly incurvated.

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EXTINCT SPECIES.

1. H. *sulcata.*—Beak nearly terminal; both extremities rounded; shell thin, concentrically sulcated, the ridges large retrally, formed by the union of two or more ribs; closely and obsoletely striated longitudinally, the striæ consisting of minute tubercles.—Not uncommon in the *Carboniferous Limestone* of the Forth Coal-Field.

GEN. CXXXVIII. PANOPÆA.—Shell transverse, unequally open at the sides; a single conic tooth in each valve, with an adjoining short compressed callus, to which an external ligament is attached.

575. P. *Aldrovandi.*—Truncated at both extremities, and coarsely wrinkled transversely.

Chama Glycimeris, *List.* Conch. t. ccccxiv.—Mya Glycimeris, *Don.* Brit. Shells, t. cxlii.—P. Gly. *Turt.* Biv. Brit. 42.—English coast, rare.

Length about 4 inches, breadth 8; coarse and thick; a series of wrinkles behind the teeth. One specimen from the Dogger-bank occurred to Mr Donovan, and a fragment of a valve found on the beach at Teignmouth, by Dr Turton, are the only British examples of this shell, which is sometimes found on the coast of France and Spain.

MYADÆ.

GEN. CXXXIX. MYA. — Equivalve, transverse, gaping; hinge with a single projecting dilated tooth in the right valve, for supporting the ligament, with a pit in the left.

576. M. *truncata.*—Shell rounded anteally, abruptly truncated retrally; the ventral margin nearly straight.

Concha lævis, *List.* An. Ang. 191.—Conch. t. ccccxxviii.—M. trun. *Linn.* Syst. Nat. i. 1112. *Penn.* Brit. Zool. iv. 78. t. xli. f. 14. *Mont.* Test. Brit. 32. *Turt.* Biv. Brit. 31.—Common near low water-mark, lodged in sand or gravel.

Length about 2 inches, breadth 3 inches; white, with a thin cuticle often of rusty colour; concentrically striated; smooth in the middle; the broad vertical tooth has usually an oblique rib from the beak to its retral angle, and is marginated anteally; the pit in the opposite valve for the ligament is horizontal, with a small tooth or projection on its anteal margin. The animal is frequently used as food, when boiled. In Zetland it is so used, and is called *Smurslin.*

577. M. *arenaria.*—Shell rounded at both extremities; the retral one slightly produced and attenuated.

Linn. Syst. i. 1112. *Penn.* Brit. Zool. iv. 79. t. xlii. *Mont.* Test. Brit. 30. *Turt.* Biv. Brit. 32.—Common near low water-mark, lodged in sand or gravel.

Length sometimes reaching 3 inches, breadth five and a half; it chiefly differs from the last in the production of the posterior extremity, by the presence of a few obsolete longitudinal ridges, in being more compressed, and the tooth rounder, syphon impression more conical.—This species, called at Southampton *Old Maids*, and at Cork *Sugar Loons*, is more frequently found in estuaries under the influence of fresh water, than the preceding. The *M. ovalis* of Dr Turton, Biv. Brit. 33. t. iii. f. 1, 2, seems nothing more than the young of M. arenaria, "with the tooth flattened at the top, and flexuous."

578. M. *Norwegica.*—Dorsal margin nearly straight, waved and truncated retrally, rounded anteally.

Turt. Linn. iv. 178.—M. striata, *Mont.* Linn. Trans. xi. 188. t. xiii. f. 1. —M. pellucida, *Brown*, Wern. Mem. ii. 505. t. xxiv. f. 1.—Lyonsia striata, *Turt.* Biv. Brit. 35. t. iii. f. 6, 7.—English and Irish coasts.

Length half an inch, breadth an inch; thin, semitransparent, with a brown cuticle, rugged retrally; longitudinally striated; inequivalve. According to Dr Turton (whom I have followed in bringing together the preceding synonims, not, however, without considerable hesitation), the tooth is an independent process, moveable with the ligament.

579. M. *decussata.*—Ovate, with irregular concentric ridges, decussated by regular longitudinal striæ.

Mont. Test. Brit. Sup. 20.—Frith of Forth, *Mr Laskey.*

Diameter about half an inch; white; margin waved; umbo-obtuse, recurved, and placed nearest to one end; a tongue-shaped syphon mark; in one valve a broad erect tooth, in the other a projecting plate, with a small indenture for the reception of the tooth of the opposite valve. Its generic relations uncertain.

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EXTINCT SPECIES.

1. M. *mandibula.*—Gibbose, flattish in the middle, transversely undulated; retral side square, gaping, anteally straightish.—*Sower.* Min. Conch. t. xliii. —In *Green Sand.*

2. M. *intermedia.*—Depressed, smooth, twice as wide as long; sides rounded, the anteal one small, the retral one expanded and gaping a little.—*Sower.* Min. Conch. t. lxxvi. f. 1, and t. ccccxix. f. 2.—*London Clay.*

3. M. *plana.*—Rather depressed, smooth; wider than long; ovate; nearly equilateral; retral side rather elongated.—*Sower.* Min. Conch. t. lxxvi. f. 2.—*Plastic Clay.*

4. M. *subangulata.*—Rather depressed, smooth; wider than long; nearly equilateral, oblong-ovate; an angle from the beak to the retral margin; ventral margin slightly restricted.—*Sower.* Min. Conch. t. lxxvi. f. 3.—*London Clay.*

5. M. *lata.*—Ovate, depressed; retral side acuminated and truncated, slightly gaping.—*Sower.* Min. Conch. t. lxxxi.—In *Crag.*

6. M? *literata.*—Transversely oval, subequilateral, convex, smooth, thin, with obtuse angularly bent ridges on the central part; angles of the ridges in a longitudinal direction.—*Park.* Org. Rem. iii. 196. t. xiii. f. 16.—*Sower.* Min. Conch. t. ccxxiv. f. 1.—*Inferior Oolite.*

7. M? *scripta.*—Transversely oval, subequilateral, convex, smooth, thin, with oblique angularly bent ridges on the central part; angles of the ridges in an oblique direction.—*Sower.* Min. Conch. t. ccxxiv.—*Inferior Oolite.*

8. M? *angulifera.*—Transversely elliptical, elongated, gibbose, with oblong angularly bent ridges upon the surface, retral half widest, gaping; angles of the ridges acute, in an oblique direction.—*Sower.* Min. Conch. t. ccxxiv. f. 6, 7.—*Oolite.*

9. M? *gregaria.*—Obovate, convex, subdeltoid, smooth; retrally produced and truncated.—*Sower.* Min. Conch. t. ccclxiii.—*Upper fresh water Formation*, Isle of Wight.

10. M. *arenaria.*—*Sower.* Min. Conch. t. ccclxiv. and t. dxxxi. f. 2.—*Norfolk* and *Suffolk Crag.*

11. M. *depressa.*—Obovate, depressed, very slightly gaping; anterior side shortest; beaks prominent incurved, hinge-line straight, depressed.—*Sower.* Min. Conch. t. ccccxviii.—*Middle Oolite.* This is probably a *Panopæa*, as it is stated that the ligament is external and short.

12. M. *gibbosa.*—Obovate, transversely furrowed, gibbose; beaks prominent, incurved; anteal side very short; retral side rather attenuated and gaping.—*Sower.* Min. Conch. t. ccccxix.—*Middle Oolite.*

13. M. *plicata.*—Oblong, ventricose, straight, anterior side short, and transversely plaited; posterior gaping, truncated.—*Sower.* Min. Conch. t. ccccxix. f. 3.—*Green Sand.*

14. M? *angustata.*—Valves unequal; transversely elongated, thin, antiquated, irregularly compressed; extremities obtuse, gaping; lower edge of the lesser valve concave.—*Sower.* Min. Conch. t. dxxxi.—*Upper marine Formation*, Isle of Wight.

GEN. CXL.—LUTRARIA.—Equivalve, transverse, gaping; hinge with a broad vertical plate for the cartilage, supporting one or two teeth on its anteal margin.

580. L. *vulgaris.*—Nearly equilateral, and rounded at both extremities.

> Concha longa, *List.* An. Ang. 170. Conch. t. xiv.—Mactra lutraria, *Linn.* Syst. i. 1126. *Penn.* Brit. Zool. iv. 92. t. lii. f. 44. *Mont.* Test. Brit. 99.—Lutraria elliptica, *Turt.* Biv. Brit. 65.—In sand about low-water mark.

Length 2½ inches, breadth 5; yellowish-white, with a thin close cuticle; slightly striated concentrically by the layers of growth, with remote obsolete ridges.

581. L. *hians.* — Retral extremity slightly produced, with the dorsal margin nearly straight and subrecurved.

Mactra hians, *Pult.* Dorset, 32.—*Don.* Brit. Shells. t. cxl. *Mont.* Test. Brit. 101.—L. oblonga, *Turt.* Biv. Brit. 64. t. v. f. 6.—In sand, beyond low-water mark.

Length 2¼ inches, breadth 5 inches; thick, coarsely striated; it chiefly differs from the last in its shortness, great breadth, the straightness of the dorsal and ventral margins, and the subrecurved aspect of the posterior extremity. In the *L. vulgaris* the syphon-mark has a smooth polished border; in this species the margin is a little raised.

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The following shells, which Dr Turton has included in his genus *Montacuta*, with the following character: "Shell oval or oblong, equivalve, inequilateral; mostly closed; hinge with two teeth in each valve, and a cavity between them; lateral teeth none; ligament internal," appear to be the fry of the species of the genera *Mya* and *Lutraria*, before they have begun to burrow in the sand or mud.

1. *substriata.*—Shell oval, with obscure longitudinal ribs; ⅛th of an inch in length; *Ligula substriata*, *Mont.* Test. Brit. Sup. 25.—*M. substriata*, *Turt.* Biv. Brit. 59.—Adhering to *Corallines* and the spines of *Echini.*

2. *bidentata.*—Shell oval, smooth, with one of the teeth oblique and spoon-shaped.—*Mya bidentata*, *Mont.* Test. Brit. 44. t. xxvi. f. 5.—*M. bid. Turt.* Biv. Brit. 60.—In cavities in old *Oyster Shells.*

3. *ferruginosa.*—Shell oblong, slightly striated transversely, with one of the teeth incurved and spoon-shaped.—*Mya fer. Mont.* Test. Brit. Sup. 22. t. xxvi. f. 2.—*M. fer. Turt.* Biv. Brit. 60.—In *Sand* and *Clay.*

4. *oblonga.*—Shell oblong, smooth, with all the teeth erect.—*M. ob. Turt.* Biv. Brit. 61. t. xi. f. 11, 12.—In *Sand.*

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EXTINCT SPECIES.

1. L. *gibbosa.*—Retral side widest, recurved, truncated and gaping.—*Sower.* Min. Conch. t. xlii.—*Oolite.*

2. L? *striata.*—Transversely oval, compressed, concentrically striated; posterior side smallest, rather pointed, gaping; beaks prominent.—*Sower.* Min. Conch. t. DXXXIV. f. 1.—*Green Sand.*

3. L? *carinifera.*—Transversely oval, elongated, convex, longitudinally striated; posterior side smooth, bounded by an obtuse carina, truncated, its edge straight.—*Sower.* Min. Conch. t. DXXIV.—*Lower Chalk.*

4. L? *oblata.* — Compressed, transversely oval, with obtuse extremities slightly bent; beaks prominent.—*Sower.* Min. Conch. t. DXXXIV. f. 3.—*London Clay.*

GEN. CXLI. SPHENIA.—Transverse, inequivalve, inequilateral, open retrally; hinge of the right valve with an elevated transversely dilated tooth, of the left valve with a concave tooth, and small denticle before it.—*Turton.*

582. S. *Binghami.*—Shell wedge-shaped, with the concave tooth oblique and inflected.

Turt. Biv. Brit. 36. t. cxi. f. 4, 5. and t. xix. f. 3.—In rocks, Torbay.

Length a quarter of an inch, breadth half an inch; cuticle brown, wrinkled; truncate anteally; beaks rather prominent, with the points not quite opposite, but divaricating from each other; the elevated tooth running in a gradually narrower and wedge-shaped manner, nearly half way along the back margin.

583. S. *Swainsoni.*—Shell oval, wedge-form, with the concave tooth projecting horizontally inwards.

Turt. Biv. Brit. 37. t. iii. f. 3. t. xix. f. 2.—In rocks, Torbay.

Length a quarter of an inch, breadth half an inch; rounded retrally.

GEN. CXLII. PANDORA. — Shell inequivalve, inequilateral; two unequal teeth in each valve.

584. P. *inæquivalvis.*—Dorsal margin behind, nearly straight; left valve smooth, the right valve concentrically striated.

Tellina in. *Linn.* Syst. Nat. 1118. *Don.* Brit Shells, t. lxi. *Mont.* Test. Brit. 75. ib.—Solen pinna. ib. 566. t. xv. f. 3.—P. margaritacea, *Turt.* Biv. Brit. 40. t. cxi. f. 11, 12, 13, 14.—English shores, rare.

Length half an inch, breadth an inch; oblong, white, glossy; anterior extremity rounded; retral extremity produced and subrecurved; the left valve along the dorsal margin angular and incurved.—It appears from the observation of M. Eudes Deslongchamp, that on each side the mouth are two long tentacula, directed retrally; and that the marginal impression of the cloak consists of a series of from 15 to 16 rounded muscular markings, two or three of which are connivent.—*Bulletin des Sciences*, Fev. 1827, 297.

GEN. CXLIII. GALEOMA.—Equivalve, equilateral, transverse; with a large oval gape at the front margin; hinge without teeth.

585. G. *Turtoni.* — Tumid in the middle, compressed towards the extremities, which are rounded and closed.

Turt. Zool. Journ. No. 7. 364. t. xiii. f. 1.—English Channel.

Length two lines and a half, breadth not quite half an inch; dirty white, the surface covered with close set, irregular transverse interrupted opaque lines; beaks prominent.

MOLLUSCA TUNICATA.

DICHITONIDA.

Inner tunic detached from the external one, and united only at the two orifices. The branchiæ are large, equal, and spread on the central surface of the inner sac, and the branchial orifice has an inner membranaceous ring, or circle of tentacula. All the British Dichitonida are fixed, and the branchial and anal orifices are not opposite to each other.

A. *Body simple.*

- *a.* Apertures furnished with four rays. The body sessile; branchiæ four on each side, the meshes uninterrupted.
  - Pandocia.
- *aa.* Apertures with indistinct rays, or more than four, the tunic soft; branchiæ destitute of longitudinal folds.
  - *b.* Body pedunculated.
    - Clavellina.
  - *bb.* Body sessile.
    - *c.* Tunic and branchial cavity straight.
      - Pirena.
      - Ciona.
    - *cc.* Tunic turned up at the base.
      - Phallusia.

AA. *Body compound.*

- *a.* Branchial orifice radiated.
  - *b.* Branchial and anal orifices with six regular rays; body sessile.
    - Polyzona.
  - *bb.* Branchial orifice only with six regular rays.
    - *c.* Body pedunculated; system single, circular, and terminal.
      - Sydneum.
    - *cc.* Body sessile, polymorphous.
      - Alpidium.
- *aa.* Branchial orifice simple.
  - Botryllus.

GEN. CXLIV. PANDOCIA.—Ovarium single, and situate in the fold of the intestine, the latter strengthened by a cylindrical rib from the pylorus to the anus.

586. P. *conchilega.*—Cylindrical or oval, wrinkled, subdiaphanous, and generally covered with the fragments of shells.

Ascidia conch. *Mull.* Zool. Dan. t. 34. f. 4, 5, 6. *Stewart's* El. i. 392.—P. mytiligera, *Savigny*, Mem. ii. 158. t. viii. f. 2.—On different parts of the Scottish coast, common.

Length upwards of an inch, the breadth about one-third less; orifices little raised, and rather remote; the inner tunic bluish-white; tentacular filaments of the branchial orifice, long, slender, and upwards of twenty in number. The *Modiolus discors* is frequently found imbedded in the integument.

GEN. CXLV. CLAVELLINA.—Branchial and anal orifices without rays; the angles of the branchial meshes simple; the intestine destitute of a rib.

587. C. *lepadiformis.*—Body transparent, exhibiting the dark coloured branchial sac, intestine and stomach.

Ascidia lep. *Mull.* Zool. Dan. t. lxxix. f. 5.—C. lep. *Sav.* Mem. ii. 174, and 237.—Not common, adhering to sea-weeds.

Length about two inches; thick at the base, where the stomach is placed; narrow during the course of the intestine, and then expanding into a blunt head for the branchial cavity; at the base there are numerous branched tubes, with a central medullary line. Dr Leach communicated this species, from the British seas, to M. Savigny in 1816. I have obtained it by dredging in Kirkwall bay, Orkney.

GEN. CXLVI. PIRENA.—The branchial sac as extended as the tunic; stomach not resting on the intestine.

588. P. *prunum.*—Ovate, smooth, greenish, and diaphanous.

Ascidia prunum, *Mull.* Zool. Dan. t. xxxiv. f. 1, 2, 3. *Stewart's* El. i. 392.—Adhering to fuci, not common.

Upwards of an inch in diameter; inner tunic white, the orifices with 7 or 8 red lines.

GEN. CXLVII. CIONA.—Branchial sac shorter than the tunic, and exceeded by the viscera.

589. C. *intestinalis.*—Lengthened, bifid at the extremity; grey, with the orifices yellow.

Ascidia int. *Linn.* Syst. i. 1087. *Ellis's* Zooph. 49.—A. corrugata, *Mull.* Zool. Dan. t. lxxix. f. 3, 4.—Adheres to fuci beyond low water-mark.

Length about two inches; thickest at the base, where it adheres by numerous coarse threads, soft and transparent; the orifices are approximate, tubular, with divided margins, and intermediate scarlet spots; the anal orifice is a little below, with six spots, the upper branchial one with eight.—It is not uncommon in the Zetland seas.

GEN. CXLVIII. PHALLUSIA.—Branchial sac extending beyond the viscera into a pouch of the tunic; stomach resting on the viscera.

590. P. *mentula.*—Oval, compressed, hairy, the inner tunic red.

Ascidia ment. *Mull.* Zool. Don. t. viii. f. 1–4. *Mont.* Test. Brit. 542. *Stewart's* Elem. i. 391.—Adheres to rocks.

Length 2 or 3 inches; brown; rough, often with adhering fragments of corals and shells; apertures distant, reddish.

591. P. *rustica.*—Subcylindrical, rough, the apertures approximate.

Ascidia rust. *Linn.* Syst. i. 1087. *Mull.* Zool. Dan. t. xv. f. 1–5. *Stewart's* El. i. 391.—Adheres to stones, shells, and fuci.

Length about two inches; outer tunic yellowish; rough and obtuse when old, red and hemispherical when young, whitish inside; inner tunic reddish.

GEN. CXLIX. POLYZONA.—Body polymorphous, with many systems arranged subcircularly.

592. P. *variolosa.*—" Crustaceous and leathery, with scattered papillæ, and two subdentated mouths."

Alcyonium ascidioides, *Stewart's* El. ii. 432. *Turt.* Brit. Fauna, 208.—Adhering to the fucus palmatus on the coast of Cornwall.

This species, which was first observed by Gaertner, and communicated by him to Pallas (Spicil. Zool. fasc. x. t. iv. f. 7.) is thus described by its discoverer: " *Crusta,* coriacea, tenax, crassiuscula, subtus plana, supra verrucis crebris, variæque magnitudinis conspersa, coloris vel dilute rubicundi vel ex croceo albicantis. Verrucæ seu tubercula maximam partem ovalia et ex croceo rubra sunt: singulum autem duplici perforatum est orificio minimo coccineo, quod turgidulus margo ejusdem coloris atque sex distinctus radiis, quasi in tot discessus fuerit dentes, cingit."—Sav. Mem. 38.

GEN. CL. SYDNEUM.—Body inversely conical; anal orifice simple and tubular.

593. S. *turbinatum.*—Pale red, gelatinous, and transparent.

Sav. Mem. 238.—On rocks.

Length about half an inch above the common base, which spreads on the rocks; narrow below, and gradually becoming thicker towards the top, the summit of which is slightly concave; mouths prominent, freckled with yellow, with short blunt conical tentacula; stomach surrounded with glands;

intestine spirally folded; ovarium pedunculated.—Dr Leach communicated this species to M. Savigny, from the British shores in 1816. I have found what I am inclined to consider as the same species, on the shore of the Isle of May, in the Frith of Forth.

GEN. CLI. ALPIDIUM.—Individuals in a single row round the common centre; systems destitute of a central cavity, and the angles of the branchial meshes without papillæ.

594. A. *ficus*.—Fleshy, lobed, yellowish.

Alcyonium pulmonis instar lobatum, *Ellis*, Cor. 82. t. xvii. f. 6.—A. ficus, *Linn.* Syst. i. 1295.—A. ficus, *Sav.* Mem. 183.

Spreading and dividing into flattish lobes, about an inch and a half in diameter; of a dark olive colour; and, when opened, emitting a very disagreeable smell; numerous granules, connected by filaments distributed through the mass in the intervals of the systems.

GEN. CLII. BOTRYLLUS.—Systems consisting of one or more regular concentric rows, furnished with a central cavity.

* *Individuals disposed in a single row, with the central cavity apparent and denticulated.*

595. B. *Schlosseri*.—Lead coloured, the branchial orifices white, with a circle of yellow spots.

Alcyonium carnosum, *Schlosser*, Phil. Trans. 1756, 449. t. xiv. *Borl.* Corn. 254. t. xxv. f. 1, 2.—A. Schlosseri, *Linn.* Syst. 1294.—B. Sch. *Sav.* Mem. 200. t. 20. f. 5.—On rocks and sea-weeds.

Many inches in breadth, and sometimes an inch in thickness; semitransparent; individuals claviform, variegated with yellow and red; tentacular filaments 8, alternately short and long.—M. Savigny refers to this species the *A. Borlasii* of Dr Turton's British Fauna, described by Dr Borlase, Corn. 254. t. xxv. f. 3, 4. though it probably belongs to a different genus.

** *Individuals disposed in several rows.*

596. B. *conglomeratus*.—Gelatinous, convex, with conglomerate finger-like divisions, and toothless terminal mouths.

(*Gaert.* Pal. Spic. Zool. 16. 39. t. iv. f. 6.)—Alcyonium con. *Turt.* Brit. Fauna, 208.—B. con. *Sav.* Mem. 204.—On the Cornish Coast.

This species is still involved in considerable obscurity. The same remark is applicable to *Alcyonium constellatum* Borl. Corn. 254. t. xxv. f. 5, 6. of Dr Turton's British Fauna.

MONOCHITONIDA.

GEN. CLIII. SALPA.—Branchial cavity open at both ends, the orifice valvular.

597. S. *moniliformis.*—Both extremities produced, the anteal one the longest.

MacCulloch's Description of the Western Isles, ii. 188. t. 29. f. 2. *Flem.* Edin. Phil. Journ. ix. 248.—Common in the sea among the Western Islands in August.

When young, the individuals adhere laterally in such a manner as to form a chain upwards of a foot in length; when full grown, and detached, they exceed an inch in length. At each extremity of the back, there is a conical longitudinal process, nearly equal to the body in length; the retral process exhibits some appearance of a vascular structure; the stomach is of a dark brownish-orange, and (as well as the branchial band) is distinctly seen through the transparent gelatinous body.

RADIATA.

Class I. ECHINODERMATA.—Skin coriaceous or crustaceous; intestinal canal distinct, and contained in an abdomen; numerous apparent vessels connected with circulation aud reproduction. Marine.

II. ACALEPHA.—Skin soft, frequently gelatinous; stomach and intestines never floating in a particular cavity; traces of circulating vessels obscure. Marine.

III. ZOOPHYTA.—Mouth surrounded by a circle of tentacula; body generally compound, and assuming plant-like forms.

IV. INFUSORIA.—Apparently destitute of a visible mouth, stomach, or internal vessels.

I.—ECHINODERMATA.

ORDER I.—Free.

SECT. I.—*Locomotion executed by means of suckers. These consist of tubular extensile processes, with a terminal, usually fringed disc, which serves either as an organ of motion or rest; the central canal admitting water to the aërating organs.*

A. Covering of immoveable testaceous plates, without projecting arms. ECHINIDÆ.

A A. Covering crustaceous and moveable.

- *a.* Body produced. *Fistulidæ.*
- *a a.* Body depressed, or orbicular, and divided into arms or rays. *Asteriadæ.*

SECT. II.—*Destitute of suckers for locomotion.*

Sipunculus.
Priapulus.

ORDER II.—Fixed; the body covered by articulating plates, supported by an articulated column.

Crinoidæ. Margin of the oral disc supporting numerous articulated arms.

Blastoidæ. Margin of the oral disc destitute of arms; body with avenues of branchial pores.

ECHINIDÆ.

The covering consists of numerous angular plates, adhering by simple or serrated sutures, and pierced by numerous pores. These pores give passage to the canal of the tentacular processes which are connected with the investing integument. The plates are also covered with tubercular processes, supporting moveable spines. The body, when at rest, is supported on the oral disc.

I. Anocysti.—Vent in the dorsal surface.

- *a.* Vent central, in the axis of the body.
  - Cidaris.
  - Echinus.
  - *Clypeus.*
- *a. a.* Vent lateral above the margin.
  - (Cassidula.
  - Nucleolitis.)

II. Pleurocysti.—Vent marginal.

- Echinarachnius.
- Spatangus.

III. Catocysti.—Vent in the under surface.

- *a.* Mouth central.
  - *b.* Avenues of pores limited.
    - Echinocyamus.
    - (Echinanthus.
    - Echinodiscus.)
  - *b. b.* Avenues of pores complete.
    - *Conulus.*
    - (Echinoneus)
- *a. a.* Mouth not central.
  - *Echinocorys.*

ANOCYSTI.

In those species in which the mouth and vent are at opposite ends of the axis of the animal, the body is globular or hemispherical, and divided into ten compartments by ten avenues of pores. The avenues approach in pairs, making five of the compartments smaller than the others with which they alternate. The smaller compartments consist of a double row of plates, united to each other by a zig-zag line, and to the larger compartments by a straight subserrated suture. Each plate is covered with tubercles, on the surface next its fellows, in the same compartment, but on the surface towards the opposite side, it is perforated with pores, in pairs, and arranged in oblique lines, with an oral direction. The portions of the plate, with the pores, are frequently compound. These plates increase in size, from the mouth to the middle of the body, where the avenues of the pores are at the greatest distance, and then decrease to the pelvis, where the pores approach, and terminate in a pentagonal costal plate. In the inside of the mouth there are five plates perpendicular to the margin, and perforated in the middle, from which the smaller compartments take their rise. The large compartments likewise consist of a double row of plates, united by a zig-zag line, covered with tubercles without pores, widest in the middle of the body, and terminating in the five plates of the pelvis, one of which, termed the *wart*, is curiously puckered, and all of them have a large perforation. These plates form the ring of a circular space, covered by a tough skin, with tubercles, and perforated in the centre by the vent. Around the mouth there is likewise a circular space, formed by a tough muricated skin. The whole body is covered with an integument, more or less intermixed with muscular fibres. The appendices of the skin are of three kinds. 1. The *prickles* are of different sizes, and are seated on the convex surface of the tubercles, which are received into their concave bases, thus forming a ball and socket joint, surrounded by the integument, and put in motion by its agency. These serve the purpose of defence, and assist locomotion. Their structure is radiated from the centre, with distinct traces of concentric layers of growth. *Mr Haidinger*, in his translation of Mohs's Mineralogy, vol. ii. p. 91, has stated, that, in a fossil state, " every one of the spines of *Echini* consists of a single individual (Rhombohedral Lime Haloide) perfectly cleavable, and the axis of which is parallel to the axis of the spine. But, what is still more remarkable, the spines of these animals possess the same property, *even in recent specimens of the latter*, and it appears, that the carbonate of lime crystallizes as rhombohedral lime-haloide upon the body of these animals." We suspect that this acute mineralogist has been deceived by considering as recent what were, in fact, fossil specimens. At least no such crystalline arrangement as is here described, exists in the spines of the *recent* British Echini, not even in the large prickles of *Cedaris papillata*, one-eighth of an inch in diameter. 2. The *jointed bodies*, which have long been considered as distinct animals, and constituting the genus Pedicellaria of Müller, are dispersed among the prickles. They are supported on a moveable spinous stalk, enveloped by the integument, furnished with one or more joints, and terminating in a head, which, when alive, is continually in motion. At the base, where they adhere, a small eminence may be observed, different, however, from the ordinary tubercles, with articular surfaces. These are conjectured by Monro to be similar in their functions to the antennæ of insects. 3. The *suckers* are placed on the avenues of pores. They consist of longitudinal and circular muscles, with a terminal disc for adhesion. These are connected with the integument. The perforation in the disc is single, and leads into a canal, which divides and enters the shell by two pores; each pair of pores belonging to a single sucker. By means of these suckers, assisted by the spines, the animal moves slowly along the rocks in search of food or shelter. The mouth is furnished with five converging teeth, fixed in large complex sockets. These are connected by a strong ligament, with five processes, which project perpendicularly inwards from the margin of the aperture, and serve as points of insertion for the muscles of the jaws. The gullet, after some convolutions, enters a larger intestine, which describes some waving circles, and then opens at the vent. The intestine is accompanied by a mesentery and two parallel vessels, which probably perform systemic and pulmonic functions. The water is admitted into the interior, for the purpose of aërating the blood by a very singular organization. On the inside of the shell, from the pelvis to the mouth, there is a straight vessel, under the ziz-zag line of each of the smaller compartments. This vessel, in its course, communicates by parallel lateral canals, with a row of vascular, foliaceous membranes, situate on each side and underneath the avenues of pores. These membranes consist of convoluted anastomosing vessels, communicating by two ducts with two of the external perforated suckers, each sucker sending a tube to two different leaves. These five vessels near the mouth, subdivide, enter large receptacles at the base of the sockets of the teeth, and then open externally, probably through the tubular processes of the oral plate, though, according to Monro, by canals through the sockets of the teeth. According to this author, the water enters the perforated suckers, passes along the five tubes, and escapes at the mouth. Future observation, however, will probably assign an opposite direction to the current, and the perforated tubes on the oral disc as the orifices at which the water enters. The organs of reproduction appear to be limited to five ovaria, intimately connected, and opening by five oviducts, in the perforations of the five plates of the pelvis. When in season, the roe fills a great part of the cavity of the shell. It is eaten when boiled, and has a flavour not unlike a lobster.

GEN. I. CIDARIS.—Tubercles and spines connected by a central ligament. The avenues of pores are parallel and closely placed, rendering the smaller compartments narrow, tortuous, and fit only for supporting small spines. The plates of the larger compartments have an elevated tubercle in the middle, with a groove round the base, surrounded with a broad smooth space, which is inclosed on the margin of the plate, with a border of small tubercles, destitute of a pit in the summit. On each central tubercle there is placed a large spine, connected by the central ligament and investing integument. M. Lamarck (Hist. Vert. iii. 53.) considers this central ligament as a muscle issuing from the interior, for moving the spine. But it has no communication with the interior of the shell. He likewise supposes that the tubular suckers can be withdrawn into the shell by the animal. But the division of the canal at the base, for the passage of each branch through a different pore, renders this impossible. Round the base of these large spines, smaller ones are placed, on the ring of tubercles, which surround them like a sheath. Each avenue consists only of a double row of pores, in pairs, corresponding with a single row of tubular suckers.

1. C. *papillata.*—Primary spines nearly cylindrical, with numerous rough longitudinal ridges.

C. p. major, *Leske* apud *Klein*, Ech. p. 125. tab. vii. A. and xxxix.—2. Echinus Cidaris? var. a. *Sower*. Br. Mus. tab. xliv.—Found in deep water, Zetland, where it is called the *Piper*.

The body of the shell is about two inches in diameter, and depressed at both ends. The longest primary spines are about four inches in length. The shortest near the mouth do not exceed half an inch. These last are spatulate as well as the small ones on the oral plate. The plates of the division between the pores, consist each of a large and small tubercle, supporting small spines, and scattered eminences to which the articulated bodies adhere, and two pores. The five bones of the pelvis are subquadrangular, from the ring of the vent, and, externally, are wedged in by fine subtriangular costæ.

EXTINCT SPECIES.

1. C. *Parkinsoni*.—The tubercles immediately above the margin the largest; the small compartments prominent.—*Park.* Org. Rem. iii. 10. t. i. f. 4, 5–8.—*Lower Oolite.*

2. C. *papillata*.—Body depressed; each compartments with two rows of tubercles, encircled by a distinct groove at the base.—*Park.* Org. Rem. iii. t. 1. f. 9.—*Mant.* Geol. 189. t. xvii. f. 18.—In *Chalk* and *Oolite.*

3. C. *intermedia*.—Lesser compartments half the width of the larger ones; tubercles crenulated at the base.—Echinita, *Park.* Org. Rem. iii. 13. t. i. f. 6. —*Oolite.*

4. C. *Urii*.—Single plates only observed; tubercle with a double ring, the margin of the plate granulated; spines finely striated longitudinally, and prickly towards the extremity. I have found, adjacent, what appears to be one of the teeth.—Echinus, *Ure*, Ruth. 318. t. xvi. f. 7, 8.—*Carboniferous Limestone.*

Many more species are indistinctly referred to by Plott, Lister, Luid, and Parkinson.

GEN. II. ECHINUS. SEA-URCHIN.—Tubercles and spines destitute of the central connecting ligament.

In this genus the primary spines are more numerous, and produced; the avenues of pores are separated by larger tubercular spaces, approaching at each end.

* *Three double rows of pores in each avenue; the ring round the vent formed by the plates of the pelvis.*

2. E. *esculentus*.—Plates covered with numerous nearly equal tubercles.

Merret's Pin. 192. *List.* An. Ang. 169. tab. iii. f. 18. *Sib.* Scot. ii. 3. p. 26.—*Borl.* Corn. p. 278. tab. xxviii. 27. *Monro*, Phys. Fishes, p. 66. tab. xliii. and xliv. *Penn.* Br. Zool. iv. p. 67. tab. xxxiv. f. 74. *Cordiner's* Ruins, No. xiii.—Found on rocks at low tides, common.

This species varies considerably in shape and colour. The avenues of the pores have waved transverse grooves, and a few scattered tubercles. In each compartment there are two rows of primary tubercles, with numerous others, of different sizes, covering the whole surface. A series of 10 tuberculated plates surrounding the margin of the mouth, each with a central extensile sucker.

3. E. *miliaris*.—Plates with a single large, and a few small, tubercles.

Cidaris miliaris saxatilis, *Leske* ap. *Klun.* p. 82. tab. ii. A, B, C, D. xxxi, A, D. xxxviii. 2, 3.—E. m. *Flem.* Mem. Wern. ii. p. 246.—From Zetland, in deep water.

Avenues of the pores nearly smooth, and narrower than the preceding. The double row of primary tubercles in each compartment very distinct, the smaller ones few in number, having a space in tho middle of each, nearly smooth.

* *Five double rows of pores in each avenue. The ring round the vent formed by the plates of the pelvis and the costals.*

4. E. *subangularis.*—Each oblique row of pores curved towards the mouth, the intervening spaces with a row of tubercles.

Cidaris subangularis, *Leske*, p. 106. t. iii. C, D.—Common on the rocks with *E. esculentus.*

In each of the large compartments there are about ten tubercles in each transverse row, and in the smaller about six. Each plate, however, has one tubercle larger than the rest. The margin of each pair of pores seems raised, with a groove between those which are contiguous in the same row. The markings on the avenues of pores appear to distinguish this species from the Rupestris of Leske, p. 111., which is the Saxatilis of Gmelin. It is probable that this species has been confounded with *E. esculentus.* The structure of the pelvis, and the number of pores, characters belonging to different systems of organs in the animal, leave no room to doubt of the propriety of their separation.

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EXTINCT SPECIES.

1. E. *saxatilis.*—Hemispherical, depressed; compartments with two rows of small, nearly equal tubercles; little more than half an inch in diameter.—*Park.* Org. Rem. iii. t. iii. f. 1.—*Mant.* Geol. 189.—*Chalk.*

2. E. *Konigii.*—Circular, much depressed, lesser compartments with two rows of tubercles; thirty rows of tubercles on the vertex, and twenty on the base.—*Park.* Org. Rem. iii. 12. t. i. f. 10.—*Mant.* Geol. 189.—*Chalk.*

GEN. CLYPEUS.—Depressed, with ten avenues of pores in pairs; a groove from the vertex to the margin on one side.

1. C. *sinuatus.*—Round, the avenues of pores, in the pairs, recede from each other from the vortex towards the margin.—(*Plot*, t. ii. f. 9, 10.)—*List.* An. Ang. 224.—*Park.* Org. Rem. ii. t. ii. f. 1.—*Oolite.*

2. C. *lobatus.*—The groove deep, and dividing the margin into two lobes.—*List.* An. Ang. 223.—*Oolite.*

3. C. *clunicularis.*—Oval.—(*Smith's* Fossils, f. 6.), Geol. Eng. 188.—*Oolite.*

PLEUROCYSTI.

GEN. III. ECHINARACHNIUS.—Mouth central.

5. E. *placenta.*—Subconic, with five avenues of pores, circumference angular, base flat.

Echinus p. *Linn.* Syst. MCV. 16.—"Isle of Foulah, very rare," Professor Jameson.

GEN. IV. **SPATANGUS.**—Avenues of pores circumscribed. A groove or band extends from the mouth, which is transversely lunate, to the four orifices of the oviducts in the vertex. Anus in a compression in the margin, with a circumscribed space immediately underneath.

a. *A subquadrangular space on the vertex*, containing the orifices of the oviducts, inclosed by a narrow band. The pairs of pores in the avenues not connected by lines. Compression at the vent vertical.

6. S. *cordatus.*—Mermaids' Heads; Sea-eggs.—A deep groove on the margin between the mouth and vertex.

Echinus spatagus, *Merret*, p. 192., Depressed cordate sea-egg. *Bor.* Corn. p. 278. tab. xxviii. f. 28.—E. c. *Penn.* Brit. Zool. iv. p. 69. t. xxxiv. f. 75.—Spatagus flavescens, *Muller*, Zool. Dan. iii. p. 17. tab. xci. f. 1–4.—S. pusillus, *Leske*, ap. *Klun.* p. 230. t. xxiv. c, d, e. tab. xxxviii. 5.—Common in all the sandy bays.

Length about two inches; vertex hollowed; oviducts in pairs, diverging, with an intermediate punctured space; vent vertically ovate; the inclosed spaces, beneath, rhomboidal, with two pores in the lateral angles; primary spines few, on rough tubercles; spaces between the pairs of pores in the avenues smooth.

7. S. *ovatus.*—Groove between the mouth and vertex obsolete.

Flem. Wern. Mem. v. 287. t. 6., lower figure. *Leske* ap. *Kl.* p. 252. tab. xlix. f. 12, 13.—Scottish coast, rare.

Diameter an inch and a quarter, purple; vertex nearly even; oviducts approximate, with the punctured space behind, and the spines covering this place produced; vent transversely ovate, the inclosed space beneath cordiform, with single lateral pores; primary spines, supported on tubercles, with a central ligament, and surrounded by a moniliform ring; the spaces between the pairs of pores in the avenues rough.

This species differs so much from the preceding in so many characters, as to leave no room to doubt its claim to rank as a distinct species. Doubts, however, may be entertained as to the propriety of the synonym prefixed. This species is more globular than expressed in Leske's figure, and the line from the oviducts to the mouth, instead of being carinate, is flat. A single specimen of this species occurred to me in 1809 in Zetland. In 1825, Dr Coldstream found another on Leith sands.

b. *Destitute of a subquadrangular space on the vertex.* The pairs of pores in the avenues connected by transverse lines. Compression at the vent oblique.

8. S. *purpureus.*—Vertex sloping to the margin.

Muller, Zool. Dan. i. p. 5. tab. vi. 1–5. copied by *Leske*, tab. xliii. f. 3–5. with a good description.—Echinus lacunosus, *Penn.* Br. Zool. iv. p. 69. tab. xxxv. f. 76.—On the English coast, rare.—Frith of Forth, common.

Upwards of three inches in diameter; purple. Oviducts approximating with the punctured space behind. Vent transversely oval. Inclosed space beneath reniform. Two anterior avenues of pores abbreviated. Primary tubercles, with a central ligament, a moniliform ring at the base, and disposed in waved lines.

EXTINCT SPECIES.

1. S. *cor-anguinum.*—Cordate, subconvex, with five grooves, each with four rows in pairs.—Echinites cordatus, *Lind.* 47. t. xii. f. 964.—S. cor. *Park.* Org. Rem. iii. 28. t. iii. f. 11.—Common in *Chalk.*

2. S. *rostratus.*—Cordiform, dorsal ridge rostrated, anterior part of the shell depressed.—*Mant.* Geol. 192. t. xvii. f. 10–17.—In *Chalk.*

3. S. *planus.*—" Ovate, vertex rather depressed; surface nearly smooth, with eight ? biporous ambulacra, diverging in pairs on each side the back and front, dorsal groove superficial, extending to the mouth; base slightly convex; mouth transversely reniform; vent placed in the upper part of the side."—*Mant.* Geol. 192. t. xvii. f. 9–21.—In *Chalk.*

CATOCYSTI.

GEN. V. ECHINOCYAMUS.—Ovoid, margin rounded; avenues of pores short and biporous; mouth and vent adjoining.

9. E. *pusillus.* — Body ovate, slightly concave round the mouth, and subdepressed above.

Spatagus pusillus, *Muller,* Zool. Dan. iii. p. 18. tab. xci. f. 5, 6.—Echinus ovalis depressus ambulacris quinis, *Walker's* Test. Min. p. 25. tab. iii. f. 88.—Ovulum marinum, læve, minimum, figuræ compressæ, *Bor.* Corn. p. 278. tab. xxviii. f. 26.—Common on all parts of the coast, from Devon to Zetland.

The margin of the mouth is irregularly notched. Where the avenues meet there are four large pores, the orifices of the oviducts.—Muller states the size at nine lines. I have not found it exceeding two lines, nor ever alive. In some the vertex is prominent, and the avenues of pores indistinct, and they likewise exhibit differences in the disposition of the tubercles.

Is the " *Echinus subrotundus planus lobatus,* the flat roundish lobated Echinus, the colour opaque, white, from Reculver, very rare," of *Walk.* Test. Min. 25. t. iii. fig. 89, an Echinocyamus ? I am not aware that it has come under the notice of any recent observer.

GEN. CONULUS.—Conoid, vent lateral.

1. C. *albogalerus.*—Obscurely pentagonal, divided by ten biporous avenues into five large and five very small compartments; surfaces covered with minute granulæ; vertex with five perforations.—*Park.* Org. Rem. iii. 19. t. ii. f. 10, 11.—*Mant.* Geol. 190. t. xvii. f. 8–20.—*Chalk.*

2. C. *vulgaris.*—*Park.* Org. Rem. iii. t. ii. f. 3.—*Mant.* Geol. 191.—In *Chalk.*

3. C. *subrotundus*.—Subglobose, divided by biporosous avenues into five wide and five narrow compartments; vent in the margin.—*Mant.* Geol. 191. t. xvii. f. 15.—In *Chalk*.

GEN. ECHINOCORYS.—Oval, vaulted; mouth transverse, lateral, the vent towards the opposite margin.

1. E. *scutatus*.—A prominent angular ridge, from the vertex to the vent; surface finely granular; height and breadth nearly equal.—*Park.* Org. Rem. iii. 21. t. ii. f. 4.—In *Chalk*.

2. E. *pustulatus*.—Ovate, conical, narrow at top, with an angular ridge from the vertex to the vent; avenues biporous from the vertex, the pores becoming inclosed in pairs by raised circles near the margin.—Echinites punctis prominentibus, *List.* An. Ang. 225.—*Oolite.*

3. E. *ornatus*.—*List.* An. Ang. 224. t. vii. f. 28.—*Oolite.*

FISTULIDÆ

Covering, a flexible skin.

The body is lengthened. The mouth is terminal, and furnished with a circle of (generally) osseous pieces instead of teeth, and surrounded by retractile tentacula. Opening of the oviduct near the mouth; anus terminal. This includes the species constituting the genus Holothuria of Linnæus. The indigenous species may be placed provisionally under the following sections:

I. Suckers arranged in five longitudinal rows, from the mouth to the vent.
Holothuria.

II. Suckers confined to one part of the body, forming a ventral disc.
Cuvieria.

III. Suckers distributed over the surface of the body.
Mulleria.

GEN. VI. HOLOTHURIA.—Tentacula deeply subdivided.

10. H. *pentactes*.—Tentacula ten, with the mouth destitute of a fringed margin.

Hydra corallifera, tentaculis retractilibus frondosis, *Gaertner*, Ph. Tr. 1761, p. 80. tab. i. b. f. 3. A, B.—H. pen. *Penn.* Br. Zool. iv. 51. tab. xxvi.—Inhabits deep water on different parts of the coast.

The body is dusky-white, head dark brown; tentacula dark brown, covered with pale yellow papillæ. This species, in these characters, differs from the *H. frondosa* of Gunner, the *H. pentactes* of Zool. Dan. tab. cviii., which is of a deep brown colour.

11. H. *Montaguii.*—Tentacula eight, with two small contiguous subsidiary ones. Mouth simple.

H. pen. var. *Mont.* Lin. Trans. ix. p. 112. tab. vii. f. 4.—Milton Sands, Montagu; Frith of Forth, Mr Neill.

The body is cylindric, white, covered with a mottled cuticle; towards the head the whole becomes purplish-brown; margin of the mouth white; while alive, the two small subsidiary tentacula are alternately in motion, covering the mouth; vent pentangular, red.—The subdivisions of the tentacula are not so numerous as in the preceding species.

12. H. *Neillii.*—Tentacula ten, with ten subsidiary ones surrounding the margin of the mouth.

Frith of Forth, Mr Neill.

This species, in form and colouring, bears a near resemblance to the preceding, but it differs in the exterior tentacula being more subdivided, and in the number of the interior ones. These last are similar in form to the outer ones, though only about one-fourth of their size. This species was brought to Mr Neill by a Newhaven fisherman, 3d September 1818. Being in company with this intelligent observer of nature at the time, he kindly presented it to me, and remarked, that it was different from the two species which Professor Jameson, on his authority, had recorded (Wern. Mem. i. p. 558.), as natives of the Frith of Forth, circumstances which indicate the propriety of its specific appellation. I have since received a specimen from Cape Wrath, through the kindness of my friend Dr Coldstream.

13. H. *dissimilis.*—Body pentangular, tapering to both extremities, suckers hard, conical; tentacula of two kinds; those which are plumose are shorter than the five simple ones which are opposed to them.

A single specimen of this probably new species, about two inches in length, was found by Dr Coldstream on Leith shore.

14. H. *pellucida.*—Ten branched tentacula, translucent, with numerous white papillæ.

Mull. Zool. Dan. t. cxxxv. f. 1.—In the Zetland seas, rare.

Length about six inches, diameter scarcely one inch; whitish; five longitudinal muscular bands. The milky colour and delicate translucency of this species readily serve as distinguishing marks.

GEN. VII. CUVIERIA (*Peron*).—Body thickest in the middle, ascending, and attenuating towards the extremities.

15. C. *phantapus.* — Anteally obtuse, cylindrical; retrally acuminato-conical.

Holothuria phantapus, *Linn.* Syst. 1089. No. 2. Zool. Dan. tab. cxii. f. 1, 2, 3.—Ascidia rustica, *Penn.* Br. Zool. iv. p. 48. tab. xxiii. f. 35. —Occasionally found from Devon to Zetland.

The body is usually from 6 to 8 inches in length, of a dark brown, rough, with transverse wrinkles; the head is a rich carmine, with ten cylindrical tentacula divided at the ends; the vent is surrounded by simple tentacula; the disk has two longitudinal marginal rows of suckers, and three in the middle.

GEN. VIII. **MULLERIA.**—This genus, contemplated by Cuvier, for the reception of the *Holothuria fusus* of Zool. Dan. x. f. 5, 6, and *H. papillosa*, ib. cviii. f. 5, I have presumed to inscribe to the memory of one of the most acute, industrious, and successful investigators of the tribe to which it belongs.

16. M. *digitata.*—Tentacula twelve, ending in four obtuse branches.

Hol. dig. *Mont.* Linn. Trans. xi. p. 22, tab. iv. f. 6.—Coast of Devon.

"Body long, cylindrical, covered with minute papillæ, of a yellowish-white colour, marked with small spots of red-orange closely disposed, and in many parts confluent." The body contracts by numerous strictures. The discoverer of this species was inclined to refer it to the *H. inhærens* of the Zool. Dan. tab. xxxi. 1–7, to which, in general appearance, it bears considerable resemblance; but he could not detect the longitudinal avenues of papillæ, which are very distinct in Muller's species.

ASTERIADÆ.

a. Arms simple.
  Asterias.
  Ophiura.
aa. Arms divided.
  Astrophyton.
  Comatula.
  Marsupites.

GEN. IX. **ASTERIAS.**—Suckers in rays on the oral disc. On the dorsal aspect the covering is warty or spinous, and more or less porous. Towards the middle there is a process variously marked, analogous to the wart of the pelvis in the *Echinidæ.* The oral surface is distinguished by the mouth in the centre, from which the avenues of pores diverge, in number similar to the divisions of the body, and protected by spines or warts. The rows of pores in these avenues vary according to the species. In the interior, and corresponding with these avenues, there is a subosseous complicated skeleton. The mouth leads into a stomach, from which diverge two cæca, corresponding with each avenue. These ramify as they proceed, and each is accompanied by a mesentery. There are likewise two ovaria accompanying the cæca. They reproduce their lost parts easily. Even a single ray we have witnessed in the act of generating a mouth and new rays. The specific characters are defective, and, where obtained from dried specimens, are apt to vary so much, as to lead to the erection of spurious species. Even in live examples, the state of repletion influences the general appearance. When dried, the length of time in which they have been macerated in water, or the manner in which the animal has expired, in reference to its suckers or spines, all tend to produce varieties of expression.

* *Margin of the body pentagonal.*

17. A. *cartilaginea.*—Body flat, thin, and reticularly verrucose, with diverging obsolete rays.

Palmipes stella cartilaginea Aldrovandi, *Linck*, Stell. 29. t. 1.—Ast. placenta, *Penn.* Br. Zool. iv. 62, No. 59, t. xxxi.—A. membranacea, *Turt.* Brit. F. p. 140, No. 125.—Coast of England.

Diameter about 4 inches; the sides are slightly emarginate, giving the indications of the rays. The surface on both sides like shagreen. Dorsally the small tubercles terminate in a brush of short, sharp, nearly equal spines. On the oral disc the spines of the tubercles are unequal, more produced, and pectinated.

18. A. *gibbosa.*—Body flat, thick, with very flat, broad, short rays, slightly projecting.

Pentaceros gibbus plicatus, *Linck*, Stell. 25, t. iii. 20.—Stella marina saxis infixa, *Borl.* Corn. 260, t. xxv. f. 25, 26.—A. gibbosa, *Penn.* Br. Zool. iv. 62. *Turt* Brit. Fauna, 149.—English shores.

Diameter scarcely an inch; upper surface uniform, without the obsolete ridges of the preceding; the dorsal tubercles are more crowded, and the spines blunter; below, the tubercles support fewer, thicker, and longer spines.

** *Body divided into short rays, coriaceous above, with a border of large plates or scales on the margin.*

19. A. *irregularis.*—The dorsal marginal plates subhastate, the oral ones subrectangular, lengthened, contracted in the middle, each supporting three or four short pectinated spines.

Astropecten irregularis, *Linck*, Stell. 27, t. vi. No. 13.—Ast. irreg. *Penn.* Br. Zool. iv. 61, No. 57.—South of England.

The dorsal surface is gibbous, with small plates, reticularly disposed; orally the plates are long, and arranged in rows parallel with the margin. Avenues of pores protected by short thick spines. Diameter about 2 inches.

20. A. *equestris.*—Marginal plates oblong, and covered with tubercles, having a central eminence surrounded by a moniliform ring.

Pentaceros planus, *Linck*, Stell. 21, t. xii. No. 21.; and p. 22, t. xxxiii. No. 53.—A. eq. *Sower.* Br. Musc. t. lxiii. *Turt.* Br. Faun. 140, No. 129.—Shores of Scotland, not common; Murray Frith, James Brodie, Esq.; Frith of Forth, Patrick Neill, Esq.

About 4 inches in diameter, and about an inch thick in the middle; covered on both sides with tubercles similar to those on the marginal plates, some of which, on the dorsal disc, have the central eminence oblong, and divided in the middle like the jaws of a vice.

21. A. *aranciaca.*—Rays depressed, lanceolate, marginal plates transversely oblong, with a rough granulated surface.

Mull. Zool. Dan. t. lxxxiii. *Linn.* Syst. i. 1100.—Leith shore, Dr Coldstream.

Diameter (with the rays) about 2½ inches; disc above the body and rays closely covered with short granular tubercles; the marginal plates are raised, rounded, and rough, each bearing four or five spines on the edge; the under surface of the plates is covered with short imbricated spines, the central margin pectinated.

*** *Body deeply divided into rays.*

22. A. *rubens.*—Body with five rays, covered with sessile, pectinated tubercles, reticularly disposed.

Pentadactylosaster asper hispidus, *Linck*, 35, t. xxxv. No. 59.; and p. 40, t. xv. xvi. No. 26–41, xvii. 27, xiv. 25.—A. rubens, *Linn.* Syst. 1099.—A. hispida, *Penn.* Br. Zool. iv. t. xxx. f. 58.—On the Scottish coast, frequent.

Diameter about 6 inches; the rays a purplish-red, rounded, and lengthened; the tubercles brown, numerous, with very short, blunt, rough spines.

23. A. *endica.*—Rays nine, closely covered with tubercles ending in a tuft of short blunt spines.

Sower. Br. Misc. t. xxiv.—Occasionally found in the Frith of Forth.

This species bears a near resemblance to the preceding. It differs, however, besides the number of rays, in the tubercles being irregularly crowded, in those on the margin of the rays being more produced and pectinated, and in the greater length of the spines guarding the canals below.

24. A. *papposa.*—Rays twelve or fourteen, covered with produced tubercles, supporting short spines.

Linck, p. 41, No. xxxii. No. 52.; and xxxiv. 54. *Linn.* Syst. 1098, No. 2.—A. helianthemoides, *Penn.* Br. Zool. iv. 66. No. 72.—Common on all parts of the coast.

In this species, which sometimes reaches to 8 or 10 inches in diameter, the rays vary from twelve to fourteen; the body is coarsely villous, but somewhat lax; the spines on each side of the avenue of suckers in pectinated brushes, four or five in each; on each side the rays is a thin row of elevated tubercles covered on the top with short spines, with a lateral vacant space.

25. A. *glacialis.* Cross-fish.—Rays angular, covered with short, blunt, single, cylindrical spines.

Stella coriacea acutangula, *Linck*, p. 31, t. xxxvi. No. 61.; cancellata, (young), p. 32, t. vii. *n. g.*—*Baster*, Op. Sub. 111. 116. t. xii. f. 1–6.—A. gl. *Linn.* Syst. 1099, No. 5. *Penn.* Br. Zool. iv. p. 60, No. 54.—A. clathrata (young), p. 61, No. 55, t. xxx. f. 1.—Common.

This species, nearly a foot in diameter, has from four to six rays; in general it has five; these are usually subtriangular, the ridge above marked by a line in the middle of the ray. The spine of the tubercle frequently surrounded by a moniliform ring. On the margin of the suckers the spines are more produced. When young, the surface is cancellated. It is reckoned destructive to oyster-beds.

26. A. *spinosa.*—Rays of almost equal thickness, and thinly covered with produced spines.

Linck, p. 35, t. iv. No. 7. *Bor.* Corn. p. 259, t. xxv. f. 18.—*Luid* found this species on the west of Ireland, and afterwards in Cornwall, as mentioned by Linck, but neither he nor Borlase have given any satisfactory details.

27. A. *oculata.*—Rays rounded, nearly smooth, and dotted.

Pentadactylosaster asper oculatus, *Linck*, p. 35, t. xxxvi. No. 62, and Porphyraster Luidii, *ib.* 81, (and referred to by Stewart, El. i. p. 401, as his *seposita*, but the description is that of *rubens*).—A. oculata, *Penn.* Br. Zool. iv. 61, No. 56. t. xxx. f. 56. *Cordiner's* Ruins, No. 15.—Not common on the English and Scottish coasts.

The tubercles are minute, and pectinated. The avenue of suckers narrow. Of a purple colour, and seldom above 2 inches in diameter.

GEN. X. OPHIURA.—Suckers placed along the sides of the arms.

28. O. *granulata.*—Body dorsally destitute of scales, but closely covered with minute tubercles.

Stella scolopendrioides granulata, *Linck*, 50, t. xxvi. No. 43.—Asterias nigra, *Mull.* Zool. Dan. t. xciii. f. 1–4. *Flem.* Edin. Phil. Journ. vol. viii. p. 301.—Kirkwall Bay, Orkney.

The body is rounded, depressed, black; between each ray at the base, orally, there is a triangular scale; the rays taper gradually; the scales are transverse, simple, and a little rounded on the edge; the spines on the sides are a little longer than the diameter of the ray, five or six in the transverse rows, with one or two imperfect ones at the base on the oral surface.

29. O. *bracteata.*—Body dorsally imbricated with smooth scales.

Stella scol. bracteata, *Linck*, 50. and 81, t. xxxvii. No. 68.—Ast. lacertosa, *Penn.* Br. Zool. iv. p. 63, No. 62, t. xxxii. f. 62.—A. ophiura, *Turt.* Br. Faun. p. 140, No. 132. *Stewart*, El. p. 401, No. 8.—Not rare in sandy bays.

This is a small species, the body seldom exceeding a quarter of an inch, the rays exceeding an inch. On each side of the rays at the base, dorsally, there is a broad scale, with a pectinated edge. Between each ray at the base, orally, a smooth scale; rays with imbricated triangular scales, those on the sides pectinated with very short blunt spines. When these last are rubbed off, the rays appear not unlike the tail of a lizard.

30. O. *brachiata.*—Body dorsally, with oval scales in the alternate broad and narrow rays.

Asterias brach. *Mont.* Linn. Trans. vii. p. 84.—In sand, Salcomb Bay.

The arms are disproportional, reaching to 8 inches, while the body is scarcely half an inch. This circumstance induces me to conclude that it is the "Stella scolopendroides hirsuta seu grallatoria, vel Macrosceles Luidii" of Linck, p. 50. (the *Asterias minuta* of Penn. Br. Zool. iv. p. 63, No. 61.) Luid calls it, "Stella geniculata hirsuta, quinis radiis exilibus prolongis ex orbiculata modiola prorumpentibus," ib. p. 81. At the junction of each arm, according to Montagu, are two oblong smooth plates; the spines of the arms from eight to nine in each transverse row. The scales on the arms, orally, near their base, are bisulcated longitudinally. The body between the arms is rough with minute papillæ.

31. O. *Bellis.*—Body dorsally with separate round scales, the intervals with short, blunt, small tubercles.

Stella scolopendroides, Bellis scolopendrica, *Linck*, 52, t. xl. f. 71. Asterias aculeata, *Muller*, Zool. Dan. t. xcix. f. 1–3. *Flem.* Edin. Phil. Journ. vol. viii. p. 298.—Scottish coast, not uncommon.

The body is pentagonal, with usually a coloured border; margin with minute warts; the arms, above, with oval scales, surrounded with a moniliform ring,—below, the scales are emarginate on the distal and proximal edges; the spines not equal to the diameter of the arm, five or six in the row, blunt and smooth.—This and the following species seem a favourite food for cod-fish, as we have found great numbers in the stomach, both on the north and west coasts.

32. O. *Rosula.*—Body, dorsally, spinous, with two large, smooth scales at the base of each arm.

St. scol., Rosula scol. *Linck*, p. 52, t. xxvi. No. 42. *Borl.* Corn. t. xxv. f. 19–24. Ast. sphærulata, pentaphylla, varia, aculeata, hastata, fissa, et nigra, *Penn.* Br. Zool. iv. p. 63. No. 63–69, t. xxxii. 63.—A. fragilis, *Muller*, Zool. Dan. t. xcviii. f. 1–4. Radiated Star, *Cordiner*, Ruins, No. 16. A. aculeata, *Stewart's* El. 1. p. 401, No. 9.—Common on all parts of the coast.

The body between the arms is usually prominent, and covered with minute warts. The scales of the arms, dorsally, are imbricated, with a ridge in the middle, and a slight projection on the distal ridge. Those placed orally are similar to the scales of the preceding species. The spines have four or five in the row, are longer than the diameter of the ray, minutely denticulated, and above the base of each denticule on the spine, there is a pore, according to Cordiner.—This species has been confounded with the preceding by Linnæus, in the Syst. Nat. p. 1101, No. 12, under the title *aculeata.* Abildgaard, in the Zoologia Danica, by terming it *fragilis*, has increased the confusion. M. Lamarck (An. sans Vert. 11. 544.) has still farther added to the difficulties by quoting Linck's figure of *rosula*, first as synonymous with the *granulata*, which, however, as usual, he alters and terms *echinata ;* then, as a species something different from *aculeata* of Muller, of which he seems in doubt, yet changes into *squamata ;* and, lastly, as a species which he had not seen, under the title of *rosularia ;* while the *fragilis* of Muller ranks as a species different from them all ! Among the *Echinodormata*, indeed, this author is singularly bewildered. In such a state of confusion, I have preferred the specific names of Linck.

GEN. XI.—ASTROPHYTON.—Dorsal disc exposed, coriaceous, and destitute of jointed filaments; the five arms dichotomously subdivided, with simple spines. At the base of each side of the rays, on the oral disc, there is a semilunar opening. Cordiner states, probably on good authority, that the species adhere by the dorsal disc, and that it is difficult to disengage them. The preference is here given to the old term of *Linck*, instead of *Euriale* of Lamarck.

33. A. *scutatum.*—Body with ten warty ridges.

Linck, p. 65. tab. xxix. No. 48. and tab. xxx. No. 49.—Asterias caput-medusæ, *Linn.* Syst. 1101, No. 16.—Asterias arborescens, *Penn.* Brit. Zool. iv. 67. No. 73. *Cordiner's* Ruins, No. 19.—A. Caput-medusæ, *Turt.* Brit. Faun. 149, No. 131. *Stewart's* El. i. p. 402.—Cornwall, *Dr Borlase.*—Orkney, *Mr Low.*—Zetland, (where it is called *Argus*), *Prof. Jameson.*

The arms are rounded and warty dorsally, flat orally, with a single row on each side of short pectinated spines, corresponding with the tentacula. Between each ray, on the oral disc of the body, there is a depressed coriaceous space, and on each ray are two rows of tentacula. Mouth pentagonal, with a knob opposite the space of each ray. We have not had an opportunity of examining a British example of this species; but, upon comparing one from the Pacific Ocean, with the figure and description which Cordiner has given of one from Norway, no marked differences appear to exist. In another, however, brought from the coast of Greenland, and presented to me by that accomplished navigator Captain Scoresby, the dorsal disc and rays were destitute of those numerous warts which characterize the A. *scutatum.* It belonged to the A. *costosum.* It therefore seems doubtful to which of these species the British examples should be referred.

GEN. XII. COMATULA.—Dorsal disc clothed with calcareous, jointed, incurved threads, ending in a claw; arms subdivided, narrow, jointed, with tapering articulated processes on each side. These, in some species, have a membrane fimbriated at the edges, on the oral aspect. The oral disc is globose, surrounded by the base of the arms.

34. C. *rosacea.*—Dorsal filaments exceeding thirty.

Link, p. 55. tab. xxxvii. No. 66.—Asterias bifida, *Penn.* Brit. Zool. p. 65. No. 70.—C. fimbriata, *Muller*, Crin. p. 132. tab. i.—Pensance Luid, Millford Haven, Mr Miller.

The figures of Linck and Miller have a considerable resemblance, though the specimen from which the former has been taken, had been deprived of its dorsal filaments.

35. C. *barbata.*—Dorsal filaments ten in number.

Decanemos barbatus, *Linck*, 55. t. xxxvii. f. 64.—Asterias decanemos, *Penn.* Brit. Zool. iv. 66. t. xxxiii. f. 71.—A. pectinata, *Adams*, Lin. Trans. v. 10.—West coast of Scotland, Pennant; Wales, Adams.

" Both the pinnated and simple rays of this species are closely jointed throughout, and from these articulations arises its flexibility. The pinnæ on the under side are furnished with hollow tubes, gradually decreasing in size as they approach the end; from which proceed, at the will of the animal, small filiform transparent flexible bodies, which are probably the organs of feeling. On separating one of the pinnæ from the main stem, the flesh was found to be composed entirely of small opaque globes (eggs ?). The filiform rays, or perhaps more properly the radicles, since by them the animal attaches itself to any thing, are each terminated by an incurvated claw, resembling in figure, and evidently for the same purpose, as the claw of birds. The body is covered, on the upper side, by five unequal valves. It is remarkable of this species, that it is furnished with *two* apertures, one at the confluence of the valves, the other in the largest valve; their position with respect to the centre is variable; the last may readily escape observation, except when the animal chooses to elevate it above the plane of the valve. When fully expanded, the inside appears clothed with a fine membrane; longitudinally folded, and revolute at its margin; colour deep red."—*Adams.* The second orifice here mentioned by Mr Adams is probably the vent (or oviduct), and seems to have been overlooked by subsequent observers.

GEN. MARSUPITES.—Body, subglobose, covered by calcareous plates, united by simple sutures, destitute of filaments, of which the dorsal central one is angular, surrounded by a series of costal plates, admitting intercostals at their peripheral angles, these giving insertion to the scapulæ which support the arms ; the oral disc covered by articulated plates, with the mouth in the centre.

1. M. *ornatus*.—Plates of the body sixteen, radiated; arms dichotomous; the plates covering the mouth, disposed in a proboscideal form.—Tortoise Encrinite, *Park.* Org. Rem. ii. 225.—M. orn. *Mill.* Crin. 136.—M. Milleri, *Mant.* Geol. 184. t. 16. f. 6.—In *Chalk.*

GEN. XIII. SIPUNCULUS.—Mouth a retractile proboscis, with a laciniated margin. Vent lateral, near which are the orifices of the oviducts. The species burrow in the sand, or in the cavities of old univalves.

36. S. *nudus*.—Body of nearly equal thickness throughout, longitudinally and transversely striated.

Penn. Brit. Zool. iv. 36. t. xx. f. 10.—English coast, frequent.

37. S. *saccatus*.—Body covered with a loose skin, smooth, and globular at the extremity.

Mont. Lin. Trans. vii. p. 75.—Teignmouth, *Mr Martin.*

M. Cuvier conjectures that this may be merely the preceding species in a state of decomposition.

38. S. *strombus*.—Body nearly cylindrical, smooth before, but verrucose behind the vent.

Mont. Lin. Trans. vii. 75.—Inhabits the old shells of Rostellaria pes Pelecani, Devon, *Mont.*

The animal contracts by means of agglutinated sand, the aperture of its assumed dwelling, leaving only a small round opening. Shells of the Dentalium, in the Frith of Forth, are frequently found contracted at the mouth in this manner, but the species remains to be determined.

GEN. XIV. PRIAPULUS.—Body lengthened, cylindrical, the mouth terminal, with corneous teeth; vent terminal, with a projecting process covered with filaments.

39. P. *caudatus*.—Head enlarged, with twenty-four rows of minute pointed processes.

Holothuria priapus, *Linn.* Syst. i. 1091. *Fab.* Faun. Grœn. 355. *Mull.* Zool. Dan. t. xcvi. i. and t. cxxxv. 2.—Scottish seas.

Length about 6 inches, diameter half an inch; the middle of the body is nearly of equal thickness, divided into flat smooth rays, with scattered glandular pores; the anterior portion is enlarged, annulated, and longitudinally striated; mouth orbicular, marginated, the disc, within, armed with sharp tricuspidate teeth; the posterior part of the body is also enlarged, obscurely annulated and rough, with glandular tubercles; vent semilunar, with a lateral pore; the branchiæ proceed from the margin of the vent, in the form of an elongated process, two or three inches long, tapering, and closely covered with simple produced papillæ; from one edge of the branchiæ a tendinous rib arises, extending nearly to the mouth.—This genus has numerous relations to the Holothuria, and a few also to the Annelides. One specimen occurred to me in Zetland, in 1810, and two have recently been found by Dr Coldstream, at Leith.

CRINOIDÆ.

I. Plates of the body, or pelvis, resting on the last columnar joint, and forming the cup containing the viscera articulated with each other by lip-like and transverse processes, having a minute perforation.

Apiocrinites.
Pentacrinus.
(*Encrinites.*)

II. Plates of the body articulating imperfectly with each other by transverse processes, having a minute central perforation.
Poteriocrinites.

III. Plates of the body adhering by sutures lined by muscular integument.
Cyathocrinites.
(*Caryocrinites.* Zool. Journ. ii. 311.)
Actinocrinites.
Rhodocrinites.
Platycrinites.

IV. Plates of the body anchylosing with the last columnar joint.
(*Eugeniacrinites.*)

GEN. APIOCRINITES.—Pelvis of five plates, supporting five costal plates; fingers formed of a single series of joints.

1. A. *rotundus.*—Column round, central; canal round; articulating surfaces of the columnar joints radiated.—Pear Encrinite of Bradford, *Park.* Org. Rem. ii. 208. t. xvi. f. 1.—A. rot. *Mill.* Crin. 18.—In *Oolite.*

2. A. *ellipticus.*—Column elliptic; central canal round; articulating surfaces of the columnar joints transversely ridged; auxiliary side-arms on the column. Bottle Encrinite, Straight Encrinite, and Stag Horn Encrinite, *Park.* Org. Rem. ii. 231. t. xiii. f. 31, 34, 75.—A. ell. *Mill.* Crin. 33.—In *Chalk.*

GEN. XV. PENTACRINUS.—Pelvis of five plates, supporting five costals; column not enlarging at the summit; fingers formed of a single series of joints; column pentagonal; the articulating surfaces of the columnar joints petal-shaped.

40. P. *europæus.*—Arms ten, nearly simple, axillary side arms five at the summit of the body.

Memoir on the Pentacrinus europæus, a recent species discovered in the Cove of Cork, with two illustrative plates, 1st July 1823, by *J. V. Thompson*, Esq. F. L. S.

This valuable addition to the British Fauna was found attached to the stems of various species of Sertulariadæ and Flustradæ, growing in from eight to ten fathoms water. Height about three-fourths of an inch, and invested with a delicate, continuous, gelatinous cuticle. The base of the column is expanded into a convex calcareous plate, by which it is attached to foreign bodies; from a depression in the centre of this plate arises the filiform column, slightly incrassated towards the summit, and capable of bending or twisting, composed of about twenty-four joints; the external form and internal structure of the column not ascertained. Axillary side arms in a single row around the last joint of the column, corresponding with each of the costals, revolute, composed of about ten joints, the terminal one hooked. Plates of the pelvis too obscure to be determined. The first costals are thick, wedge-shaped, broadest upwards, the distal extremity emarginate, and supporting a second costal of a narrow subconical form, truncated and emarginate where it joins the scapula. The summit of the scapula is angular, having a sloping face on each side, for the attachment of the first arm joints. The arms are ten in number, and being supported on scapulæ greatly narrower than the first costals, are rather remote at their base. The arms consist of about twenty-four solid joints, tapering towards the extremity, simple in youth, but with age and size dividing and subdividing; along the side a row of dark spots; each arm supports on each side, in an alternate order, a row of annulated cylindrical, flexible, fleshy processes, covered with capitate filaments. The arms in these respects resemble those of the *Comatula*, in which I have observed a similar row of brown tubercles with a granular surface, a fleshy production on the ventral margin of the arm, broadest at the middle, supporting cylindrical processes, fringed with smaller filaments, ending in an expanded sucker-like extremity. Within the costals, the body is subglobular, in the centre of which is the mouth, formed by five petal-like valves, within which are several soft tentacula; without the valves is an opening with a tubular extensile margin, supposed to be the vent. In the early stages of its growth neither column nor arms are visible, the body appearing like a little club, fixed by an expanded basis, and giving exit, at its apex, to a few pellucid tentacula. The existence of the second aperture in the body of the genus *Comatula*, which Mr Thompson, in the interesting paper from which we have extracted the description of this species, supposes not to have been previously observed, was known to Mr Adams thirty years ago, and described by him in the Linnean Transactions published in 1800. In the Annals of Philosophy for Nov. 1806, Mr Gray likewise announced the existence of this second aperture, without being aware of its previous detection. If future observations, on better preserved specimens, shall confirm the results of Mr Gray's examination of the recent *Pentacrinus caput Medusæ*, and demonstrate that it has but one opening to its alimentary canal, it will be necessary to constitute this species, discovered by Mr Thompson, into a new genus, which may be termed HIBERNULA (the forerunner we hope of many important additions to our Fauna, when the shores of Ireland shall have been more extensively explored), and by characterising the family COMATULADÆ, as possessing, besides numerous other common properties, an alimentary canal with two openings, it will be naturally divided into two sections, the first containing the *fixed Hibernula*, the second the *free Comatula*.

EXTINCT SPECIES.

1. P. *Milleri.*—Auxiliary side-arms round, in single series; column smooth; columnar joints generally alternately smaller and larger.—P. Caput-medusæ, *Mill.* Crin. 56.—In *Lias.*

2. P. *basalitiformis.*—Auxiliary side-arms round, in single series; column smooth; columnar joints generally of more uniform thickness.—*Mill.* Crin. 62.—*Lias.*

3. P. *tuberculatus.*—Auxiliary side-arms round, in single series; column tuberculated.—*Mill.* Crin. 64.—*Lias.*

4. P. *subangularis.*—Auxiliary side-arms round, in a double series. *Mill.* Crin. 59.—In *Lias.*

5. P. *Briaereus.*—Auxiliary side-arms angular, in a single series; column smooth. *Mill.* Crin. 56.—In *Lias.*

GEN. POTERIOCRINITES.—Pelvis of five joints, with five costals; fingers of a single series of joints; column not enlarging, round; central canal round; articulating surface of the joints radiated; auxiliary side-arms round.

1. P. *crassus.*—Joints of the fingers thick; plates of the pelvis articulating by transverse ridge-like processes.—*Mill.* Crin. 68.—*Carboniferous Limestone.*

2. P. *tenuis.*—Joints of the fingers slender; plates articulating by minute striæ. *Mill.* Crin. 71.—*Carboniferous Limestone.*

GEN. CYATHOCRINITES.—Pelvis of five plates, with five costals; the fingers of a single series of joints; column not enlarged; articulating surface of the columnar joints radiated; auxiliary side-arms round, and placed irregularly.

1. C. *planus.*—Column and central canal round; plates smooth.—*Mill.* Crin. 85.—In *Carboniferous Limestone.*

2. C. *tuberculatus.*—Column and central canal round; costal plates tuberculated.—*Mill.* Crin. 88.—*Carboniferous Limestone.*

3. C. *rugosus.*—Column round; central canal petal-shaped; costal plates with angular rugged striæ.—*Mill.* Crin. 89.—*Carboniferous Limestone.*

4. C. *quinquangularis.*—Column and central canal pentangular; costal plates smooth.—*Mill.* Crin. 92.—*Carboniferous Limestone.*

GEN. ACTINOCRINITES.—Pelvis formed of three plates, with five costals and one intercostal; fingers of two series of joints; column and canal round, the articulating surfaces radiated; auxiliary side-arms round and irregular.

1. A. *triacontadactylus.*—Thirty fingers proceeding from five scapulæ.—*Mill.* Crin. 95.—*Carboniferous Limestone.*

2. *Polydactylus.*—More than thirty fingers proceeding from five scapulæ.—*Mill.* Crin. 103.—*Carboniferous Limestone.*

GEN. RHODOCRINITES.—Pelvis of three plates, with five costals and five intercostals; fingers of two series of joints; column not enlarging, round, the canal petal-shaped.

1. R. *verus.*—Auxiliary side-arms round and irregular.—*Mill.* Crin. 106.—*Carboniferous Limestone.*

GEN. PLATYCRINITES.—Pelvis of three plates; costal or intercostal plates wanting the five scapulæ; fingers of two series of joints; column not enlarging near the summit; auxiliary arms round, irregular.

1. P. *lævis.*—Column elliptic; canal round; articulating surfaces transversely ridged; the five scapulæ smooth, having each four fingers.—*Mill.* Crin. 74.—*Carboniferous Limestone.*

2. P. *rugosus.*—Column elliptic; canal round; articulating surfaces transversely ridged; the five scapulæ rugose, having each six fingers.—*Mill.* Crin. 79.—*Mountain Limestone.*

3. P. *pentangularis.*—Column and canal pentangular; articulating surfaces radiated; the five scapulæ smooth.—*Mill.* Crin. 83.—*Mountain Limestone.*

4. P. *tuberculatus.*—Column not known; the five scapulæ tuberculated.—*Mill.* Crin. 81.—*Mountain Limestone.*

5. P. *granulatus.*—Column not known; the five scapulæ granulated.—*Mill.* Crin. 82.—*Mountain Limestone.*

6. P. *striatus.*—Column not known; the five scapulæ striated.—*Mill.* Crin. 82.—*Carboniferous Limestone.*

BLASTOIDÆ.

GEN. PENTREMITES.—Pelvis of three unequal pieces, two pentagonal and one tetragonal; scapulæ large, emarginate; five avenues of pores; column cylindrical, perforated, the segments articulating by radiated surfaces; cylindrical auxiliary arms at irregular distances.

1. P. *globosa.*—Body subglobular; pelvis saucer-shaped, convex; sutures with parallel impressed lines.—(*Say*, Journ. Acad. Phil. iv.) Zool. Journ. ii. 314.—Near Bath.

2. P. *Derbiensis.*—Body subglobular; pelvis small, pentagonal, and concave; surface granulated.—*Sower.* Zool. Journ. ii. 317.—*Carboniferous Limestone*, Derbyshire.

3. P. *elliptica.*—Body elliptical, pelvis small, pentagonal, and concave; granulated.—*Sower.* Zool. Journ. ii. 318.—Near Preston, Lancashire.

ACALEPHA.

I. Sect.—Fixed; the base, opposite the mouth, adhering to other bodies.

- A. *Tentacula surrounding uninterruptedly the oral disc.*
  - Actinea.
  - Mammaria.
- AA. *Tentacula on the margin of the oral disc disposed in tufts.*
  - Lucernaria.

II. Sect.—Free; the base opposite the mouth incapable of adhering to other bodies.

- A. *Body closed opposite the mouth.*
  - *a.* Body strengthened internally by a cartilaginous plate.
    - Velella.
  - *aa.* Body destitute of an internal cartilaginous plate.
    - *b.* A mouth in the centre of the oral disc.
      - *c.* Destitute of lateral cavities.
        - Eulimena.
        - Geryonia.
      - *cc.* With four lateral cavities, or ovaries.
        - Cyanea.
    - *bb.* Destitute of a mouth in the centre.
      - Rhizostoma.
      - Cassiopea.
- AA. *Body open at both extremities.*
  - Beroe.
  - Pleurobrachia.

GEN. XVI. ACTINEA.—Base with the disc capable of shifting place; mouth terminal, retractile; tentacula numerous.

41. A. *equina.*—Body smooth, finely wrinkled transversely; margin of the disc with a row of tubercles.

A. equina, *Linn.* Syst. i. 1088.—Hydra disciflora, tentaculis retractilibus, extimo disci margine tuberculato. *Gaertner*, Phil. Trans. 1761, t. i. f. 5. *Dicqemare*, Phil. Trans. 1773, 364. t. xvi. f. 1.—A. hemisphærica, *Penn.* Brit. Zool. iv. 50.—A. mesembryanthemum, *Turt.* Brit. Fauna, 131.—A. rufa, *Stewart's* El. i. 393.—Common, adhering to rocks.

Body, when contracted, hemispherical, red or brown, smooth; base blackish-grey, with unequal, tubercular, diverging ridges, the margin with a purple ring; tentacula numerous, lengthened, of the colour of the body, or variegated; exterior to which, there is a ring of about twenty purple tubercles; the margin of the mouth is slightly tinged with purple.

42. A *senilis.*—Body rough, with numerous rows of glandular warts, tentacula shorter than the body.

Hydra disciflora, tentaculis retractilibus subdiaphanis; corpore cylindrico, miliaribus glandulis longitudinaliter striato, *Gaert.* Phil. Trans. 1761, 82. t. i. f. 4.—A. senilis, *Linn.* Syst. i. 1088. *Dicq.* Phil. Trans. 1773, 866. t. xvi. f. 10.—A. verrucosa, *Penn.* Brit. Zool. iv. 49.—A. crassicornis, *Adams*, Linn. Trans. iii. 252.—A. equina, *Sower.* Brit. Misc. t. 4.—A. gemmacea, equina and crassicornis, *Turt.* Brit. Fauna, 130, 131.—A. crassicornis, *Stewart's* El. i. 393.—In crevices of rocks and sand, common.

Body reddish, the tips of the glands pale, the glands themselves are disposed in vertical and transverse rows, to which adhere fragments of rock and shells; the feelers are numerous, conical, or lengthened, and variously annulated or variegated with white and red.

43. A. *sulcata.*—Body longitudinally sulcated, the tentacula exceeding its length.

Hydra tentaculis denudatis, numerosissimis; corpore longitudinaliter sulcato, *Gaert.* Phil. Trans. 1761, 78. t. i. f. 1.—A. sul. *Penn.* Brit. Zool. iv. 48.—A. maculata, *Adams*, Linn. Trans. v. 8.—A. cereus, *Turt.* Brit. Fauna, 131.—A. sul. *Stewart's* El. i. 394.—Rocks of Cornwall.

Body smooth, of a chesnut colour, the margin of the oral disc dentated; the tentacula, which the animal cannot wholly withdraw, are greenish, with a red tip, nearly 200 in number, and greatly exceed the body in length.

44. A. *pedunculata.*—Body lengthened, the lower part narrow, smooth, the upper enlarged, and glandularly warty; oral disc expanded, lobed; tentacula in several rows, variegated.

Hydra calyciflora, tentaculis retractilibus variegatis, corpore verrucoso, *Gaert.* Phil. Trans. 1761, 79. t. i. f. 2.—A. ped. *Penn.* Brit. Zool. iv. 49.—A. bellis, *Turt.* Brit. Fauna, 131.—A. plumosa, *Stewart's* El. i. 394.—Southern coast of England.

Stalk cylindric, body suborbicular, of a brown colour, with fragments of shells adhering to the warts; tentacula unequal, those nearest the mouth longest, variegated; a spotted space round the mouth variegated. A gregarious species.

45. A. *dianthus.*—Body cylindrical, oral disc expanded, five lobed imbricated, with short tentacula.

Ellis, Phil. Trans. 1767, 436. t. xix. f. 8.—A. pentapetala, *Penn.* Brit. Zool. iv. 50.—A. senilis, *Adams*, Lin. Trans. v. 9.—A. dianthus, *Turt.* Brit. Fauna, 131. *Stewart*, El. i. 394.—Gregarious in pools near low-water mark.

Body soft, pale bluish-white, diaphanous, with whitish veins, and numerous pores; oral disc lobed at the pleasure of the animal, covered with short narrow flat tentacula; mouth deeply striated, four of the striæ on one side more deeply seated, forming prominent ridges.

46. A. *intestinalis.*—Body cylindrical, the upper half suddenly contracted, and narrow.

Fab. Fauna Groen. 351. t. i. f. 11.—Adheres to rocks at low-water mark, Zetland.

When contracted, the body seems like two broad rings, of nearly equal breadth, and about half an inch in diameter; when expanded to nearly two inches, the body consists of two cylindrical portions, of different dimensions, smooth, pellucid, yellowish; a few longitudinal white streaks under the skin; oral disc not expanded, surrounded with about 18 filiform tentacula in two alternate rows.

47. " A. *anemonoides.*—Nearly cylindrical, rather short, red; interior tentacula ramified, outer ones conic, obtuse.

" Rocky coasts, *Shaw*, Nat. Misc. t. xxvi. 27.

" Body with a triple concentric row of tentacula, of a yellow colour, varied with red; stomach pale yellov, with red and pale sea-green stripes."—*Turt.* Brit. Fauna, 131.

48. " A. *caryophyllus.*—Red-brown, with small pencil-formed tentacula.

" *Martin's* Marine Worms, i. 1. t. i. f. 1."—*Turt.* Brit. Fauna, 131.

GEN. XVII. MAMMARIA.—Body smooth, mouth terminal, without tentacula.

49. M. *mamilla.*—Conical, ventricose, and white.

Mull. Prod. Zool. Dan. 224. *Jameson*, Wern. Mem. i. 557.—On fuci, Leith shore, Professor Jameson; Belfast, Mr Templeton.

GEN. XVIII. LUCERNARIA.—Body narrow towards the adhering extremity, expanding into an oral disc which is divided into lobes bearing the tentacula.

50. L. *auricula.*—Peduncle of the body short, tufts of tentacula equidistant, with one intervening oval vesicle.

Fab. Fauna Groen. 341. *Mull.* Zool. Dan. t. clii. *Mont.* Linn. Trans. ix. 113. t. vii. f. 5. *Lamouroux*, Mem. No. iii.—Adheres to fuci, near low-water mark, on different parts of the coast.

Body brownish, the portion next the adhering extremity cylindrical, short, terminating in a bell-shaped, wide, concave, oral disc, divided into eight lobes, each terminating in a tuft of short clavate tentacula.

51. L. *fascicularis.*—Peduncle of the body produced; tuft of tentacula in pairs, about a hundred in each.

Flem. Wern. Mem. ii. 248. t. xviii. f. 1, 2. *Lamouroux*, Mem. No. i.—On the broad leaves of fuci, Zetland.

Colour dark brown; peduncle cylindrical, flexuous, wrinkled, with a narrow base; body bell-shaped, subquadrangular, concave; margin divided into four pairs of arms, concave within; mouth central, tubular, consisting of a loose membrane, four notched at the tip, and also expanded circular or striated at the pleasure of the animal, the inside with numerous white filaments.

GEN. XIX. VELELLA.—Body gelatinous, with an obliquely inserted prominent dorsal crest ; oral disc flat.

52. V. *limbosa.*—Body oval, blue ; oral disc with numerous short white filiform tentacula, those of the margin long, unequal, filiform.

Holothuria spirans, *Forskael*, Desc. On. 104.—V. lim. *Lamarck*, Hist. ii. 482.—Barnstaple, *Dr Leach.*

Body attenuating dorsally, bluish ; the crest is suborbicular, compressed, veined ; the oral tentacula are thickest in the middle. An imperfect example of a *Velella*, which Dr Leach considered as the *limbosa* of Lamarck, was obligingly communicated many years ago.

53. V. *pocillum.*—Body round, white, with a broad striated bluish border ; oral disc with unequal clavated blue tentacula ; the margin crenulated.

Medusa pocillum, *Mont.* Linn. Trans. xi. 201. t. xiv. f. 4.—Coast of Devon.

Body campanulate ; crest subovate, striated, compressed, and extremely thin ; there are about 10 large clavated tentacula, and many intermediate smaller ones.

Dr Walker, in his *MS. adversaria* for 1771 states the *Medusa velella* of Linnæus, as having been found at Ose in Sky ; and Mr Pennant in his " Caledonian Zoology," prefixed to Lightfoot's " Flora Scotica," vol. i. 66. notices the same animal without any remark. It is impossible to determine with certainty to which of the modern species these references belong.

GEN. XX. EULIMENA.—Body pouch-like, the mouth large, with a simple margin.

54. E. *quadrangularis.*—Lengthened, subquadrangular, the oral extremity truncated, the opposite end rounded.

Flem. Edin. Phil. Journ. viii. 302.—Pentland Frith.

Length about an inch, breadth half an inch ; transparent ; 8 minute ciliated ribs from the crown to the margin ; the oral disc smooth, having the mouth in the form of a transverse slit, leading into an apparently simple central cavity. When active, the ciliæ are in constant motion, and the body frequently assumes the form of a quadrangular prism.

GEN. XXI. GERYONIA.—Hemispherical, margin with tentacula, the mouth central.

55. G. *equorea.*—Orbicular, depressed, with a villous inflected margin, bearing tentacula.

Medusa eq. *Mull.* Prod. 233. *Jameson*, Wern. Mem. i. 558.—North of Scotland.

56. G. *hemisphærica.*—With four transverse ribs, enlarged towards the circumference.

Medusa hemis. *Mull.* Zool. Dan. t. vii.—Medusa, *Cordiner's* Ruins, No. xi.—M. hem. *Macartney*, Phil. Trans. 1810, 268. t. xv. f. 5.

Minute, campanulate, the mouth subpedunculated, with five very short arms.—This species is one of those which are remarkably luminous at night, and is very common.

57. G. *octona*.—Body round subconical, blunt at the summit, and slightly acuminated.

Flem. Edin. Phil. Journ. viii. 299.—At the Bell Rock.

About an eighth of an inch in diameter; margin furnished with eight similar tentacula, equal to the diameter of the body; oral disc concave, with the central mouth slightly pedunculated.

GEN. XXII. CYANÆA.—Body hemispherical; mouth with arms; margin of the body with tentacula.

58. C. *aurita*.—Convex, translucent, with four incurved semicircular central markings; mouth with four long crenulated and ciliated arms.

Medusa aurita, *Linn.* Syst. 1197. *Mull.* Zool. Dan. t. lxxvi.—M. cruciata, *Turt.* Brit. Fauna, 139.—M. cruciata and aurita, *Stewart's* El. i. 399.—Not uncommon.

On the dorsal aspect the body is depressedly convex, smooth; the marginal tentacula are thick at the base, interrupted in the circle by eight globular organs, with two arms, having a perforated middle process with a black point; the arms do not appear in very young specimens.

59. C. *fusca*.—A brown circle in the centre of the dorsal disc, with 16 rays, of the same colour, converging from the circumference.

Urtica marina, *Borl.* Corn. 256. t. xxv. f. 7.—Medusa fusca, *Penn.* Brit. Zool. iv. 57.—Shores of Cornwall.

Convex, the circumference with 16 knobs, the termination of the rays with intermediate crooked fangs between each; mouth cruciform.

60. C. *purpurea*.—A pale purple cross in the centre, with 4 incurved semicircular marks, and 16 diverging deep purple rays.

Borl. Corn. 257. t. xxv. f. 9.—Medusa purpurea, *Penn.* Brit. Zool. iv. 57.—Common.

Margin more incurved than the preceding; rays of the cross pointed; mouth cruciform, with 4 arms.

61. C. *tuberculata*.—A granulated central spot, with 16 diverging simple rays.

Borl. Corn. 257. t. xxv. f. 11.—M. tuberculata, *Penn.* Brit. Zool. iv. 58.—Shores of Cornwall.

The margin has two tubercles between each ray. The arms are narrow, and longer than the body.

62. C. *capillata*.—Convex, the margin divided into 16 segments.

M. cap. *Bast.* Op. ii. 60. t. v. f. 1. *Turt.* Brit. Fauna, 139. *Stewart's* El. i. 399.—Not uncommon.

Colour brownish, with a central mark, from which 16 rays diverge; oral disc with numerous capillary filaments.

GEN. XXIII. RHIZOSTOMA.—Four cavities beneath, with a central peduncle divided into arms.

63. R. *undulata.*—Circumference waved, with fangs in the projecting parts.

Borl. Corn. 257, t. xxv. f. 15.—M. und. *Penn.* Brit. Zool. iv. 58.—Shores of Cornwall.

Margin thin; peduncle divided into eight arms, with a pair of lobes at the base of each.

GEN. XXIV. CASSIOPEA.—Eight cavities beneath, with eight arms.

64. C. *lunulata.*—Margin with numerous semicircular fangs tipped with blue.

Borl. Corn. 258, t. xxv. f. 16.—M. lun. *Penn.* Brit. Zool. iv. 58.—Shores of Cornwall.

On the oral disc there are eight semicircular openings, with eight arms having jagged edges, and sixteen jagged processes at the base.

* * *

The characters of the preceding species of the Linnean genus *Medusa*, require revision, and the species should be studied with reference to the changes in form which they experience by age. The *Medusa simplex* of Pennant and *M. scintillans* of Macartney, are probably the fry of some of the established species.

GEN. XXV. BEROE.—Body with vertical ciliated ribs; tubular vessels traverse the axis of the body, with lateral and terminal apertures.

65. B. *ovatus.*—The body orbicular, slightly depressed at the summit, and a little protuberant at the base.

Bast. Op. i. 123, t. xiv. f. 5.—B. infundibulum, *Fab.* Fauna Groen. 360.—Beroe, *Flem.* Wern. Mem. iii. 401, t. xviii. f. 3, 4.—Frith of Tay.

The following observations were made from an inspection of the only specimen of this animal which I have had an opportunity of seeing: " There were eight vertical bands or ribs, extending from the summit to the base. These were narrow, denticulated on the margin, confined to the surface, and of a denser substance than the gelatinous interior. From the central surface of the ribs, a number of filaments proceeded, which were lost in the substance of the body. The mouth, or the opening at the base, had some appearance of having its margin divided into four lobes. The tube which conducts from the mouth to the centre of the body, and is prolonged in its axis to the summit, had on each side a compressed organ adhering to its walls.

These terminated in the centre, each in an ovate head, apparently containing air. Immediately below each head, there were numerous twisted vessels, some of which contained a reddish fluid. The tube which descended from the summit, as it approached the centre, suddenly expanded, and sent off a branch to a vesicle on each side; after which it appeared to unite with the one from the mouth. Each of the lateral vesicles terminated below in a blind cavity, which contained a glandular body, to the upper surface of which, several white threads were attached. The upper extremity of each vesicle was open, and terminated on the surface, on each side, in the space between two ribs. From each side of the vesicle, near its connection with the central vessel, there arose a tube, which, after dividing, sent a branch to each contiguous rib. The cavity of these tubes, at their union with the ribs, appeared to be filled with a whitish coloured pulp. Each rib is furnished with a tube, uniting with it near the middle. In consequence of this peculiar structure, I could easily observe the water enter the tube at the summit, pass into the lateral vesicles, and go out at their external openings; and, in some cases, the motion of the current was reversed. There did not appear to be any external opening at the extremity of the tubes joining with the ribs, although water obviously moved backwards and forwards in them. While the animal was active, there were numerous small spaces in the different tubes where the contained fluid circulated in eddies. This was particularly observable towards the centre, and in the tube which descends from the summit. I was unable to detect, with the naked eye, any structure in the tubes which could produce these partial motions; and the orbicular form of the animal prevented the application of high magnifiers. The species here described approaches, in many respects, to the *Beroe ovata* of Baster, Opuscula subseciva, vol. i. p. 123. tab. xiv. f. 5. It differs, however, in having only eight ribs, apparently smooth on the surface, with denticulated margins; whereas the species which Baster notices has nine ribs, thickly set with moveable hairs. The season in which ours was found, would likewise intimate that it is distinct from Baster's species, provided we attach much importance to his remarks. " In nostris hæc Beroe invenitur littoribus, et in ipsis hujus urbis portubus, Aprili potissimum mense; singularis enim variarum Medusæ specierum proprietas est, quod aliæ aliis frequentissime inveniuntur mensibus." Ellis appears to have been acquainted with this species, when he says, " The Beroe is a marine animal found on our coasts; of a gelatinous transparent nature; and of an oval or spherical form; about half an inch to an inch diameter; divided, like a melon, into longitudinal ribs, each of which is furnished with rows of minute fins, by means of which this animal, like the *animalia infusoria*, can swim in all directions with great swiftness."—Phil. Trans. vol. lix. p. 144.

66. B. *cucumis.*—Body oblong, the oral aperture wide.

Fab. Fauna Groen. 361.—B. fulgens, *Macartney*, Phil. Trans. 1810, 264. t. xv. f. 1–8.—Shore of Kent.

" This most elegant creature" (says Mr Macartney) " is of a colour changing between purple, violet, and pale blue; the body is truncated before and pointed behind; but the form is difficult to assign, as it is varied by partial contractions, at the animal's pleasure. I have represented the two extremes of form that I have seen this creature assume. The first is somewhat that of a cucumber, which, as being the one it takes when at rest, should perhaps be considered as its proper shape. The other resembles a pear, and is the figure it has in the most contracted state. The body is hollow, or forms internally an infundibular cavity, which has a wide opening before, and appears also to have a small aperture posteriorly, through which it discharges its excrement. The posterior two-thirds of the body are ornamented with eight longitudinal ciliated ribs, the processes of which are kept in such a rapid rotatory motion, while the animal is swimming, that they appear like the continual passage of a fluid along the ribs. The ciliated ribs have been described by Professor Mitchill as arteries, in a luminous Beroe, which I suspect was no other than the species I am now giving an account of. When the *Beroe fulgens* swam gently near the surface of the water, its whole body became occasionally illuminated in a slight degree ; during its contraction, a stronger light issued from the ribs ; and when a sudden shock was communicated to the water, in which several of these animals were placed, a vivid flash was thrown out. If the body were broken, the fragments continued luminous for some seconds, and, being rubbed on the hand, left a light like that of phosphorus. This, however, as well as every other mode of emitting light, ceased after the death of the animal." Mr Macartney observed this species in Hearne Bay, on the northern coast of Kent, in October 1804. None were to be found in the same place in the month of September in the following year, although some Medusæ occurred which had been the companions of the Beroe in the preceding season.

* * *

There is a third animal, nearly related to the genus *Beroe*, which is figured by the late Rev. Charles Cordiner of Banff, in his " Remarkable Ruins," No. xi. Patella, fig. *g* G. The magnified representation which he has given, appears to intimate a subcylindrical animal, open at both ends, with a raised disc near one of the extremities, surrounded with diverging spines, and exhibiting two spots, whence probably issue tentacula. The author has failed in this, as in many other instances, to give descriptions in illustration of the designs of his pencil.

GEN. XXVI. PLEUROBRACHIA.—Body suborbicular, with eight ciliated ribs and two ciliated arms, one on each side.

67. P. *pileus.*—The lateral arms equal.

Beroe, *Bast.* Op. i. 124, t. xiv. f. 6.—B. pileus, *Fab.* Fauna Groen. 361. *Scoresby*, Arctic Reg. i. 549, t. xvi. f. 4.—In the British seas, rare.

The late George Montagu, Esq. in a letter to me, dated 22d November 1812, says, " I have lately added *Beroe pileus* to the British Fauna." My friend Dr Leach, who subsequently met with the same animal, sent me in 1819 an outline drawing of its form. I have since been informed by my friend John Graham Dalyell, Esq. advocate, that it occurs in the Frith of Forth.

ZOOPHYTA.

I. CARNOSA.—Polypi connected with a fleshy substance.

II. CELLULIFERA.—Polypi lodged in calcareous cells, imperforate at the base.

III. THECATA.—Polypi surrounded by a membranaceous tube, covering the subdivisions of their compound body.

IV. NUDA.—Polypi naked, the mouth with marginal tentacula.

V. VIBRATORIA.—Polypi having the mouth furnished with vibrating hairs.

CARNOSA.

I. *Free; marine; moving by the contraction or expansion of the fleshy part; form symmetrical; axis of the body supported by a bone contained in a sac.*

- Pennatula.
- Virgularia.

II. *Fixed or stationary.*

- A. Polypiferous matter covering a solid axis.
  - *a.* Axis with stellular discs.—LAMELLIFERÆ.
    - *b.* Stellular, discs terminal.
      - *Sarcinula.*
      - *Lithostrotion.*
      - Caryophyllea.
      - Turbinolia.
      - *Cyclolites.*
    - *bb.* Stellular discs aggregated.
      - *Explanaria.*
      - *Astrea.*
      - *Porites.*
      - *Pocillopora.*
  - *aa.* Axis destitute of stellular discs.
    - *b.* Axis corneous and flexible; polypiferous basis cretaceous; the axis with spines.
      - *c.* Polypi developed.—GORGONIADÆ.
        - Gorgonia.
        - Primnoa.
      - *cc.* Polypi not developed.—CORALLINADÆ.
        - Iania.
        - Corallina.
        - Halimeda.
    - *bb.* Axis stony.
      - *Isis.*
- B. Polypiferous basis destitute of a continuous solid axis.
  - *a.* Polypi developed.
    - *b.* Polypi with eight tentacula; the basis fibrous.
      - Lobularia.
      - Cydonium.
      - Cliona.
    - *bb.* Polypi with tentacula exceeding eight in number; basis nearly uniform.
      - Alcyonium.
      - Cristatella.
  - *aa.* Polypi not developed.—SPONGIADÆ.
    - Tethya.
    - Halichondria.
    - Spongia.
    - Grantia.

PENNATULADÆ.

GEN. XXVII. PENNATULA.—Base of the body fleshy, and subcylindrical, supporting an oval, expanded, compressed head, consisting of soft processes, proceeding obliquely from a mid-rib, and supporting, on one side, the denticles or cells containing the polypi.

68. P. *phosphorea.* The Sea-pen.—Stem villous, and destitute of a spine at the base of each lateral process; colour purple.

Penna marina, *Sib.* Scot. ii. p. 28. *Wal.* Or. p. 38.—Pennatula phos. *Linn.* Syst. 1322. *Ellis,* Ph. t. liii. t. xix. f. 1, 5.—P. Britannica *Sol.* Zoop. p. 61.—Penna marina, *Cord.* R. No. 18. Adheres to the mussel-baits of the fishermen, on the east coast of Scotland, not uncommon.

The length is from 2 to 8 inches. Stem round and fleshy at the base, and closely set with minute spines; compressed and grooved in the middle between the processes, and terminating in a point. The processes commence about the middle of the stem, increase in length gradually, and then decrease in the same manner, to the point, forming, in the outline, the segment of a circle on each side. Along the upper side of each process, is a row of tubular denticles, having the margins of the mouths armed with moveable spicula. The polypi have cylindrical stems, with eight long tentacula, which are capable of retiring within the denticle.

GEN. XXVIII. VIRGULARIA.—Body linear, supporting, towards the upper extremity, sessile, lunate lobes, embracing the stem obliquely, and bearing a row of cells on their margin.

69. V. *mirabilis.*—Stem filiform, with alternate lobes transversely ridged.

Pennatula mirabilis, *Linn.* Mus. Ad. t. xix. f. 4. (copied Phil. Trans. liii. t. xx. f. 17.)—Amœn. Acad. iv. p. 257. *Pal.* Zoop. 371. *Sower.* Brit. Misc. i. p. 51. t. xxv.—On the east and north coast of Scotland, where it is believed by the fishermen to have one end lodged erect in the mud; in Zetland it is called the *Sea-Rush.*

Length about a foot. The central bone is white, filiform, and cylindrical. When broken across, it appears striated from the centre (like a Belemnite), as Lamarck found in his V. australis. On the fleshy back there is a groove from the ridge, on each side of which the lobes arise. These resemble a crest, embrace the side of the stem, and a portion of its front obliquely, and terminate in a recurrent manner, the point of one meeting with the bend of the higher one from the opposite side. Each lobe is subpectinated with about eight or ten ridges, constituting as many cells, with a simple pore on the margin for a polypus.

I have ventured to unite under this species, the preceding synonimes, though three species are constituted by Lamarck, out of the *Pennatula mirabilis* of Linnæus, Pallas, and Muller. A comparison, however, of the descriptions of these authors with the figures which they have given, and with specimens, leave no doubt of their identity. On this subject, indeed, Lamarck appears to be singularly inaccurate. Under his *Funiculina cylindrica* (Hist. ii. p. 423), which is the *Pennatula mirabilis* of Pallas, he quotes the figure of Linnæus, Mus. ad.; and, under *Virgularia juncea*, the very same figure is again referred to, and the copy thereof in the Philosophical Transactions.

LAMELLIFERÆ.

GEN. SARCINULA.—Free, massive, consisting of vertical parallel tubes, united by intervening matter.

1. D. *punctata.*—Inferior surface concentrically undulated; superior with cylindrical tubes, crenulated on the margin by subordinate pores, and divided internally by transverse partitions.—Porpital Madreporite, *Park.* Org. Rem. ii. 69. t. vii. f. 4.—Gloucestershire and Staffordshire.

2. S. *angularis.*—Inferior surface with diverging striæ; superior with crowded polygonal tubes.—Porpital Madreporite, *Park.* Org. Rem. ii. 69. t. vii. f. 3. —*Dudley*, Staffordshire.

GEN. LITHOSTROTION.—Coral of aggregated prismatical parallel tubes, with single terminal stellular discs.

1. L. *striatum.*—Hexangular; striated longitudinally; slightly waved transversely; each plane with about ten striæ; the rays of the star unite with a small solid central axis.—*Luid.* Lith. 122. t. xxiii. *Park.* Org. Rem. ii. 43. t. v. f. 6, 3.—In *Carboniferous Limestone.*

2. L. *floriforme.*—This chiefly differs from the preceding in its greater size, and the axis occupying a greater space; to which Martin adds, " centres projecting, pointed, and writhed or twisted like a rope."—*Mart.* Derb. t. xliii. 44.—In *Carboniferous Limestone.*

3. L. *oblongum.*—Pentangular, striated, the stems about one-twentieth of an inch from each other; the rays diverge from the centre, branching towards the circumference. *Park.* Org. Rem. ii. 56. t. vi. f. 12, 13.—*Oolite.*

4. L. *marginatum.*—Hexangular; each angle with a raised rib, and numerous distant, small, short obtuse processes; the planes flat and smooth; the star consists of plates from the centre to each angle, with a few transverse ones. Two detached columns of this species, about the tenth of an inch in diameter, have occurred to me in *Carboniferous Limestone.*

GEN. XXIX. CARYOPHYLLEA.—Turbinated or cylindrical, simple or branched, adhering by the base to other bodies.

70. C. *cyathus.*—Primary lamellæ of the star about forty in number, with intermediate smaller ones, and a prominent curved centre.

Madrepora cyathus, Sol. *Zoop.* 150.— C. cyathus, *Flem.* Wern. Mem. ii.

249. Two specimens found in 1809, growing on a dead valve of *Pecten opercularis*, from deep water off Foulah, in Zetland.

The largest specimen is inversely conical; a little compressed; half an inch in height; two-tenths, in its broadest diameter at the base, and six-tenths at the star, where it is four-tenths across; externally it is longitudinally striated and rough. The disc is oval, and a little compressed. The lamellæ are disposed in fours, and may be distinguished into three different kinds. The first are the highest and the broadest at the margin, but as they descend into the disc they become narrower before they join the central plate. The second kind are narrower than the preceding at the margin, but towards the middle they suddenly enlarge and join the middle plate. The third kind are the smallest, and terminate before reaching the middle plate. The space included between a pair of the first kind of plates, contains one of the second kind in the middle, with one of the third kind in each of the lateral spaces. Those on the sides are rough, with small scattered tubercles, and their margins are curled. This last circumstance occasions the roughness externally, where the longitudinal striæ are the remains of the gills. The plate which occupies the bottom of the concavity is smooth, various twisted, and connected with the base of the lateral plates. When first observed, the disc was covered with black putrid animal matter.—It has been reported that the C. *musicalis* (Ellis, Phil. Trans. 1763, t. xx. f. 14.) has been cast ashore on the Irish coast.

EXTINCT SPECIES.

1. C. *annularis.*—Branched, nearly cylindrical, with transverse plates, which exteriorly seem like a series of ligatures; surface not muricated.—Madreporite, *Park.* Org. Rem. ii. 67. t. v. f. 5.—In *Oolite.*

2. C. *fasciculata.*—Crowded, branched, round, nearly cylindrical, slightly flexuous, and about a quarter of an inch in diameter.—Madreporite, *Park.* Org. Rem. 51. t. vi. f. 8.—Madrepora cespitosa, *Mart.* Derb. t. 17.—*Carboniferous Limestone.*

3. C. *duplicatus.*—Tubes cylindrical, adjacent, unequal; centre proliferous; margin dilated.—Madrepora dup. *Mart.* Pet. Derb. t. xxx.—*Carboniferous Limestone.*

4. C. *affinis.*—Stems slightly branched, cylindrical, equal, smooth, rather distant, and about half an inch in diameter.—M. aff. *Mart.* Derb. t. 31.—*Carboniferous Limestone.*

5. C. *juncea.*—Stems slightly branched, cylindrical, smooth, or slightly wrinkled transversely, and about one-tenth of an inch in diameter.—Junci lapidei, *Ure*, Ruth. 337. t. xix. f. 12.—Very common in *Carboniferous Limestone.*

6. C. *centralis.*—Root spreading, indented; stem narrow at the base; enlarging subcylindrically towards the tip; longitudinally striated; the striæ alternately larger and smaller; no transverse striæ; disc with small and large plates from the circumference to the centre.—Corallite, *Park.* Org. Rem. ii. 32. t. iv. f. 15, 16.—Madrepora centralis, *Mant.* Geol. 159. t. xvi. f. 2, 4.—In *Chalk.*

It is probable that *Amplexus coralloides*, p. 251. though inserted by Mr Sowerby among the multilocular testacea, may yet be found connected with the present genus.

GEN. XXX. TURBINOLIA.—Turbinated, detached, base acute, not adhering; star single.

71. T. *borealis.*—Widely conical, slightly bent.

Fungia turbinata, *Flem.* Wern. Mem. ii. 250.—*Zetland.*

This species occurred in the same boat in which I picked up the *Caryophyllea cyathus.* Though greatly defaced, it still exhibits proofs of its *recent* origin. It is inversely conical, pointed, subarcuated, with a concave disc and a prominent centre; the plates appear to have been equal. It is about five-tenths of an inch in height, and nearly the same in breadth across the star.

EXTINCT SPECIES.

1. T. *sulcata.*—Inversely conical, with twenty-four longitudinal striæ, the interstices striated by pairs of pores in each, disposed in numerous parallel transverse rows.—Lamouroux Zoop. 51. t. lxxiv. f. 18, 21. Geol. of Eng. 3. *London Clay.*

2. T. *Konigi.*—Inversely conical, aperture circular, divided into numerous perpendicular lamellæ, radiating from the axis to the circumference; axis simple; margin crenulated; external surface longitudinally striated; striæ from 25 to 30, distinct, prominent, base convex.—*Mant.* Geol. Suss. 85. t. xix. p. 22, 28.—*Blue Chalk Marl.*

3. T. *Fungites.*—Inversely conical, lengthened; more or less bent; longitudinally striated, with irregular transverse wrinkles; star concave, with a large central axis. Fungites, *Ure*, Ruth. 327. t. xx. f. 6.—In *Carboniferous Limestone*, common; frequently termed *Ram's Horns.* The specimens in my possession differ greatly in their breadth compared with their length; in one the plates converge to the centre, without a solid axis; and in another, there are external drooping cylindrical processes from the sides near the small end.

GEN. CYCLOLITES.—Hemispherical; star convex, with smooth slender lamellæ; the centre depressed; below flat, with concentric lines.

1. C. *elliptica.*—Elliptical; lamellæ obsolete; the central cavity lengthened.—*Lamarck*, Hist. ii. 234.—Geol. Eng. 245.—*Inferior Oolite.*

GEN. EXPLANARIA.—Stem irregular, foliaceous, waved, lobed, with the extremities covered with sessile, stelliferous discs.

1. E. *flexuosa.*—Stem compressed, proliferous, reticulated at the base, with transverse and longitudinal striæ; the superior stellated surface covered with stars, closely set, and formed of raised undulating radii.—Madreporite, *Park.* Org. Rem. ii. 49. t. vii. f. 11.—E. mesenterica, Geol. Eng. 245?—*Inferior Oolite.*

GEN. ASTREA.—Massive, the stelliferous discs rounded, and imbedded in the nearly even surface.

1. A. *arachnoides.*—Stelliferous discs close, smooth; the plates proceeding from the centre are waved across the margin, and are lost in the surrounding matter.—Madrepora arach. *Park.* Org. Rem. ii. t. vi. f. 4.—*Oolite.*

2. A. *undulata.*—Stars continuous, the rays unequal, bifurcated and bending.—Madrepora und. *Park.* Org. Rem. ii. 56.—*Bristol.*

GEN. PORITES.—Massive, obtuse, stellular discs regular, subcontiguous, with imperfect margins; the plates of the stars filamentous, chaffy, or cuspidated.

1. P. *cellulosa.*—Cells angular, walls thin; true structure not yet discovered.—*Park.* Org. Rem. ii. 39. t. v. f. 9.—*Carboniferous Limestone?* Masbury, Mendip.

GEN. XXXI. POCILLOPORA.—Branched, the surface covered with stelliferous deep-seated discs, with the intermediate spaces porous.

72. P. *interstincta.*—Cylindrical, with distant immersed stars.

Madrepora interstincta, *Mull.* Prod. Zool. Dan. 252.

A specimen, probably of this species, which I have seen, was obtained by Dr Hibbert in Zetland, a detailed description of which, I had reason to expect, would by this time have been published.

GORGONIADÆ.

GEN. XXXII. GORGONIA.—Cells for the polypi sessile.

The axis is, in some species, of the hardness of horn, or wood, in others of the softness of leather. In its young state, at the ends of the branches, it has a soft central pith. It consists of concentric layers, homogeneous, tubular, or consisting of osseous spicula. The flesh consists of two plates, an external and internal. The external plate is more or less thickened with cretaceous matter, under different forms, and bears the cells, for the protrusion of the polypi, either simple and imbedded, or in the form of warts, with notched or spinous margins. On the inner plate (termed by Ellis periosteum) may likewise be observed perforations (through which it is probable an intimate connection subsists between the polypi and the interior of the axis), and a crowded arrangement of perpendicular tubes, which are supposed destined to secrete the corneous matter of the axis. Between these plates the fleshy matter is pulpy, with interspersed osseous spicula in some species.

a. *Cells imbedded, with simple margins.*

73. G. *flabellum.*—Venus's Fan.—Compressed, branches numerous, and reticularly united.

Ellis, Cor. p. 61. t. xxvi. A. *Linn.* Syst. 1293.—Cast ashore, Mount's Bay, Cornwall, *Borlase*.—Leith shore, *Mr John Mackay.*

The axis is black, the cells minute, scattered, and occurring chiefly on one side. There is no satisfactory evidence that this species is indigenous to our rocks. The specimens which have been found among the rejectamenta of the sea, have probably belonged to some wrecked vessel from the West Indies. At the same time, Mr Neill informs me that he saw Mr Mackay's specimen shortly after it was found, and that it had all the aspect of being fresh and recent.

74. G. *anceps.*—Subdichotomously branched, the branches free, compressed, with cells on each margin.

Keratophyton dichotomum; caule et ramulis læviter compressis, *Ray*, Syn. p. 32.—Sea-willow, *Ellis*, Cor. p. 68. tab. xxvii. f. 2–9.—G. an. *Linn.* Syst. 1292.—Margate, *Mr Dale* (*Ray*).—Ireland, *Ellis.*

The axis is of a horny nature, inclining to leather. The cells are in rows.

b. *Cells prominent, with armed margins.*

75. G. *placomus.*—Margins of the cells spinous.

Keratophyton flabelliforme, cortice verrucoso obductum, *Ray*, Syn. 32? Warted Sea-Fan. *Ellis*, Cor. p. 67. tab. xxvii. f. 1. a. A. A. 1. A. 2. A. 3. *Borl.* Corn. p. 238. tab. xxvii. No. 1. *Linn.* Syst. 1290.—Rocks, Cornwall.

The axis is ligneous. The branches are dichotomous, a little compressed, irregularly incurved, but rarely uniting. The flesh is full of denticulated spicula. The cells are conical, angular, and covered on the margin with little spines or pointed scales. It is probable that the references to Ray should be added to the following species, as Linnæus has done.

76. G. *verrucosa.*—Margins of the cells denticulated.

Ellis, Phil. Trans. i. t. xxxiv. f. 19. a. *Linn.* Syst. i. 1291. *Cav.* Mem. p. 32. tab. i. f. 1–11.—G. viminalis? *Sowerby*, Brit. Misc. tab. xl.—Cornwall, *Ellis*, and *Mr Batten.*—Devonshire, *Montagu.*—Scotland, *Sowerby.*

The axis is woody, and the flesh granular. The branches grow in a flat fan-shaped manner, subdichotomous. The cells are crowded irregularly, and their margins are denticulated. In Mr Sowerby's figure, one of the notches is represented as much larger than the others, forming about one-third of the margin. This appearance, however, is irregular, as in a specimen which I received from Mr J. D. C. Sowerby, as the *G. viminalis* of his father; the margin of the cells was regularly denticulated in some, and in others the large tooth was variable in the proportion of the margin which it occupied. Though this circumstance has been overlooked by preceding authors, there is little reason to consider it the indication of a new species, unless genuine specimens of *G. verrucosa* can be produced destitute of this character; and there is no ground for considering it as the *G. viminalis* of Ellis. According to Cavolini, the tentacula of the polypi are flat, tapering, and pinnated, and the body or head supporting these, protrudes considerably beyond the margin.

GEN. XXXIII. PRIMNOA.—Cells subpedunculated pendulous. The axis, when young, is corneous, but in the older branches it becomes like bone. The flesh is covered with minute fixed scales. The cells are crowded, bell-shaped, and with the aperture, according to Baster, closed by two valves, covered with imbricated moveable scales. The branches are dichotomous. M. Lamouroux, who first separated this genus from Gorgonia, considers the pendulous cells as the polypi themselves.

77. P. *lepadifera.*

Gorgonia lep. *Bast.* sp. 11. 130. t. xiii. f. 1. *Ellis*, Zoop. p. 84. tab. xiii. f. 1, 2.

This species, which is common on the Norwegian coast, has been found, according to Professor Jameson (Wern. Mem. i. p. 560.), at Zetland and Aberdeenshire.

CORALLINADÆ.

The objects of this group, forming the genus Corallina of Linnæus, are usually plant-like or branched, and consist of two substances, a central corneous axis, and an external calcareous crust. The axis is sometimes fleshy, and shrinks by drying, leaving a tubular cavity. The substance is fibrous, and united with the exterior crust. This last is hard, studded on the surface with minute marginated pores, and usually covering the axis in an irregularly interrupted manner, giving the body a jointed appearance. When the calcareous matter is removed by a weak acid, a granular-looking skeleton remains, the granules appearing to be united with the extremities of the fibres which proceed from the axis, and seem to be the remains of the polypi. Reproduction appears to take place by means of enlargements or processes, on the sides, or at the extremities, forming hollow cells, chiefly derived from the cortical layer. Ellis observes, " That we may perceive the pores or cells of this class the more distinctly, it is necessary they should be viewed immediately upon being taken out of the sea ; for, as they dry, the cretaceous or coralline matter shrinks, and unites the pore-like cells on the surface, scarcely to be distinguished from a polished superficies, without the help of the very best glasses." All the species reside in shallow water, in places accessible at low water of spring-tides.

GEN. XXXIV. JANIA.—Branches subdividing dichotomously; filiform, with cylindrical joints.

78. J. *rubens*.—Summits of the lower joints of the stem simple.—Not uncommon on the English, Irish, and Scottish coasts.

This species is subject to considerable variation in its general appearance and growth, arising from age and station.

A. Nearly uniform in thickness throughout, branches terminating in short bifid processes.—Corallina ramulis dichotomis, teneris, capillaribus, et rubentibus, *Ellis*, Cor. p. 50. No. 5. tab. xxiv. f. e. E.—C. rubens, *Pallas*, El. p. 426. No. 7.

B. The last joint but one, swollen at the summit, a character more or less conspicuous on the other joints. The terminal ones blunt.—C. dichotoma, capillis densis, cristatis, spermophoris, fucis minimis teretibus adnascens, *Ellis*, Cor. p. 51. No. 7. tab. xxiv. f. f. F.—Cor. cristata, *Pall.* El. p. 425. No. 6.—Cor. rubens, *Linn.* Syst. p. 1304. No. 3.

C. Joints supporting the two last subdivisions clavate, terminal ones in pairs slender, many-jointed, seldom dividing.—Cor. alba spermophoros, capillis, tenuissimis, *Ellis*, Cor. p. 51. No. 8. tab. xxiv. f. g. G. Both Pallas and Linnæus make this a variety of var. B.—It seems to be in the last stage of growth. The Cor. plumosa nivea, fuco minimo tereti adnascens of *Ell.* Cor. p. 52. No. 9. tab. xxiv. f. h. H. H. 1., the C. globifera of *Turt.* B. Fauna, No. 701. p. 212, is certainly this species in its first stage of growth, and when it consists of only two or three joints rising from a globular base. Var. A. is the next stage. In some cases, a few of the lower joints are two-horned, like the following species.

79. J. *corniculata*.—Summits of the lower joints of the stem subcompressed, and produced on each side.

Cor. alba exigua, ramulis dichotomis segmentis corniculatis, fucis minimis teretibus adnascens, *Ellis*, Cor. p. 50. No. 6. tab. xxiv. f. d. D.—Cor. corn. *Pallas*, El. p. 424. *Linn.* Syst. p. 1305.—On the English coast, Ellis.

GEN. XXXV. CORALLINA.—Branches subdividing trichotomously. In consequence of this mode of growth there is always the appearance of a primary stem, and the summits of the joints are compressed and dilated, except in old specimens, where the lower joints are cylindrical, and destitute of lateral branches.

80. C. *officinalis*.—The short lateral shoots of the branches rounded, and blunt or capitate.

Cor. anglica, *Raii*, St. Br. p. 33. *Ellis*, Cor. p. 48. tab. xxiv. No. 23. a. A. A, 1. A. 2. B. B. 1. B. 2.—Cor. off. *Pallas* and *Linnæus*.—Common on all parts of the coast.

This is subject to vary greatly in its appearance, according to the station it occupies. At certain seasons the heads of the pinnules are enlarged into cells, and similar tubercles occur on the sides of the joints, out of which Ellis squeezed "little twisted figures."

81. C. *squamata.*—The short lateral shoots of the branches compressed, and two-edged.

Cor. anglica erecta, ramulis dense pennatis, lanceolæ forma terminantibus, segmentis ad utrinque latus paululum compressis, *Ellis*, Cor. p. 49. No. 4. tab. xxiv. f. c. C.—English shores.

This species is considered both by Pallas and Linnæus as a variety of the preceding.

GEN. XXX[illegible]I. HALIMEDA.—Joints compressed, crowded.

82. H. *Op[illegible]tia.*—Branches trichotomously divided, the joints waved on the margin, and kidney-shaped.

Cor. op[illegible] *Ellis*, Cor. p. 53. tab. xxv. fig. a. A. b. B. and *Zooph.* p. 110. [illegible]ab. [illegible] f. 6.

Th[illegible] speci[illegible] as not hitherto been recorded as a British zoophyte, but is said to [illegible]habi[illegible] the Atlantic and Mediterranean. I, however, possess a specimen [illegible] longing to the late Dr Walker, to which the following note was an[illegible] own handwriting: "Submarine plant from the rocks at Salterness, [illegible] bane. An Bombycina? It covers the rocks with a close turf." It t[illegible] appears to be a native of the shores of the Solway Frith. When a join[illegible]s macerated in weak acid, the branched tubes supporting the polypi appea[illegible] as they are represented by Ellis, ib. tab. xxv. f. A. 1.

GEN. ISI[illegible]-Axis branched, striated, articulated; the fleshy crust [illegible]iduous after death.

1. Remai[illegible] an Isis "found at Calne, in Wiltshire, in a light yellow coloured limes[illegible]."—*Park.* Org. Rem. ii. 73.

GEN. XX[illegible]II. LOBULARIA.—Internally carneous, with reticulated cartilaginous fibres, and distinct converging cells, opening by stellate pores; the base where it is attached is broad and compact; the polypi have a single opening, and 8 pinnated tentacula.

83. L. *digitata.* Dead-man's-hand.—Polypi with thin pinnated, pointed, tentacula.

Alcyonium ramoso-digitatum molle asteriscis undequaque ornatum.—*Ray.* Syn. p. 31. *Ellis*, Cor. 83. t. xxxii. *a.* A. A 2. Phil. Trans. liii. p. 431. t. xx. f. 10–13.—A. digitatum, *Linn.* Syst. i. 1294. *Sol.* Zooph. 175. t. i. f. 7.—F. lobatum, *Pallas*, El. 351.—Common in the British seas, adhering to shells, rocks, and fuci.

The figure is bluntly ovate, especially when young, dividing with age into short rounded lobes, varying from a reddish-orange to a greyish-white; the pores are stellate and prominent; the cells are inversely conical. The polypi, according to Ellis, when exserted, are conico-tubular, with 8 ridges; these, I have observed to be armed near the summit, on each side, with a row of diverging spicula, like the particles composing the crust of the *Gorgonia verrucosa*, Ellis, Cor. t. xxvii. No. i. A. 3. The tentacula are depressed, broadest at the base, and terminate in a point; the pinnulæ, are opposite at first, but towards the tip become alternate; they are clavate with rough ends.—M. Lamouroux has strangely confounded his *Alcyonium lobatum* and the *A. exos* of Dr Spix with this species. With every allowance for the discrepancy which may prevail among the representations of the same animal, examined under different circumstances, by unconnected observers, it is impossible to admit that the figures given by Ellis, which have been referred to and those communicated by the above named observers, can have been taken from individuals of the same species. The tentacula in Ellis's figures (and having compared these with nature we can pronounce on their accuracy) are pinnate and pointed. In the *Alcyonium exos* of Dr Spix (Annales du Mus. xiii. t. xxxiii. f. 7.) the tentacula are subclavate, blunt, and villous; while in the *A. lobatum* of M. Lamouroux (Hist. Cor. 336. t. xiii. B, C, H) they are subcylindrical, rounded at the extremity, and covered above and on the margin with blunt tubercles. In our examination of several specimens from different parts of the coast, varying in form and colour, we have only met with the species figured by Ellis. It is probable, however, that the others may be detected in our seas.

GEN. XXXVIII. CYDONIUM.—A coriaceous skin, internally carneous, with numerous straight ridged spicula, perpendicular to the surface; polypi with a central opening, and an orifice at the base of each of the eight pinnated tentacula.

84. C. *Mulleri.*—Skin yellowish, with numerous stellate pores; internally brown.

A. cydonium, *Mull.* Zool. Dan. t. 81. f. 3, 4, 5. *Jameson* Wern. Mem. i. 563.—Zetland.

Base of adhesion narrow, body massive, surface irregular; the skin consists of animal matter cementing innumerable round siliceous grains; the cells leading from the stellate pores are indistinct; the spicula, which diverge towards the centre, are fusiform, grouped in small bundles, and many of them at the skin are tricuspidate. In a dried specimen from Zetland, which I have had an opportunity of examining through the kindness of Professor Jameson, the surface is slightly villous, owing probably to the contraction of the skin, leaving the extremities of the fibres free. With the exception of the stellate pores, it agrees with the *Alcyonium primum Dioscoridis* of Donati (Adriat. 56. t. ix. f. i.) in the villous skin and the simple and tricuspidate spicula.

GEN. XXXIX. CLIONA.—Substance fleshy, irritable, with siliceous spicula; imbedded in cavities of shells and protruding tubular contractile papillæ, on the margin of which are placed cylindrical polypi, with 8 tentacula.

85. C. *celata.*—Flesh yellow, spicula cylindrical, tubular, closed, slightly curved, pointed at one end, and terminated by a small hollow round head at the other.

Grant, New Edin. Phil. Journ.—In old shells, especially oysters, common.

Perforations circular, leading into unconnected cavities, filled with the fleshy matter; the tubular papillæ project through the circular perforations, and are connected internally with ramified canals, in the vicinity of which small yellow ova make their appearance in March and April; the papillæ eject a current of water; the marginal polypi are long, slender, and transparent, and their broad tentacula are slightly dilated at the extremities.

GEN. XL. ALCYONIUM.—Circle of tentacula complete; fleshy bases, arborescent, investing or adnate, and regularly covered with polypiferous papillæ.—Marine.

86. A. *gelatinosum.*—Sea-ragged staff or grain. Arborescent, the polypi with 12 equal tentacula.

Fucus spongiosus nodosus, *Ray.* Syn. St. p. 49. *Ellis*, Cor. p. 87. t. xxxii. [illegible]—Al. molle, ramosum, *Bast.* Op. Sub. i. p. 25. t. i. f. v.—A. gel. *Müll.* Zool. Dan. t. cxlvii. f. 1–4.—Not uncommon in deep water.

Body adheres by a narrow base to stones and shells, in from 5 to 20 fathoms water, ascending and subdividing irregularly into rounded branches, with subacute terminations; the surface is covered with minute, rounded tubercles, having pale, perforated, quadrisulcated summits, from which issue polypi, inversely bell-shaped, with 12 equal tentacula; internally, it is subcellular, with scattered round black bodies, which are probably the eggs. The whole is greenish, translucent, with a smooth and gelatinous aspect.

This species has frequently been claimed by botanists, without due consideration, as a subject of the vegetable kingdom. It is the *Fucus gelatinosus* of Hudson's Flora Anglica, the *Ulva diaphana* of Smith's English Botany, and the *Alcyonidium diaphanum* of Hooker's Flora Scotica.

87. A. *hirsutum.*—Body investing, the polypi with from 18 to 20 tentacula.

Investing fuci, common.

This species differs from the preceding in the following particulars. It grows in shallower water, among fuci and confervæ, while the other is the companion of Sertulariæ and Flustræ. Its growth is irregular, frequently anastomosing, surrounding or connecting fuci, sometimes rising into blunt, thinly subdivided, branches. It is of a closer texture, and the surface, being covered witb close set conical accuminated papillæ, gives it a hairy appearance. The polypi are not protruded so far from the orifice of the papillæ, and the feelers, which are more numerous, are constantly in motion. Some doubts may be entertained if part of the synonimes prefixed to the preceding species do not belong to the *hirsutum.* The one, however, in the Zool. Dan. is too faithful a representation of the *gelatinosum* to admit of such a suspicion.

88. A. *echinatum.*—Body incrusting dead univalve shells; the polypi with 12 tentaculæ.

This species incrusts dead univalve shells exclusively; and is about the $\frac{1}{20}$th of an inch in thickness. When first taken out of the water it is soft and spongy, but becomes rigid on drying; the surface is closely covered with tubular papillæ about $\frac{1}{20}$th of an inch in length.

The late Mr Montagu, in a letter to me, dated 12th July 1811, intimated, in reference to a specimen which I had sent him: "The crusts on shells, which gives them a muricated appearance, is what I have called *Alcyonium echinatum.* I do not know that it has been described or ascertained to be the aggregate fleshy tubular cells of polypi, having about 12 radiating short tentacula. It is the drying of the tubes that forms the rigid spinulæ."

89. A. *parasiticum.*—I place here provisionally a parasitical species, which invests the old stalks of several of the *Sertulariadæ.* It is destitute of fibres, but strengthened by denser bands, which, by anastomosing irregularly, enclose the spaces of the cells; these seem to have rounded orifices, and to be distant from each other; the surface is rugose when old, the orifices of the cells become more apparent, and the whole much mixed with mud. I have not had an opportunity of observing it in a recent state.

GEN. XLI. CRISTATELLA.—Body gelatinous, branched, with terminal polypiferous papillæ; the circle of tentacula disposed in the form of a crescent.

90. C. *campanulata.*—Body divided, palmate.

Polype à panache d'eau douce, *Trembly*, Pol. p. 227. t. x. f. 8, 9.—Tubularia camp. *Linn.* Syst. 1303. *Berk.* Syn. i. 215. *Turt.* Brit. Fauna, 211.—Adheres to Lemnæ.

The body is translucent and palmately branched, the ends of the branches forming cells; the body of the polypi is cylindrical, where exserted, narrow at the summit, with numerous tentatacula; an esophagus, stomach and intestine, together with two threads, descending into the fleshy base, are observable. It may admit of doubt whether the animal described by Roesel (iii. 559. t. xci.) constituting the *Cristatella mucedo* of Cuvier, and *Cristatella vagans* of Lamarck, and which is *free*, belongs to the same genus with the *Polype à panache* of Trembly, above referred to, which seem to be *fixed*, and to be nearly related to the genus *Plumatella.*

SPONGIADÆ.

THE sponges, which have long occupied the attention of naturalists, and given rise to considerable difference of opinion regarding their true place in the System of Nature, have at length been examined by an observer possessing the requisite leisure, opportunity, industry, and talent for conducting such intricate researches. I here refer to the papers which have appeared in the Edinburgh Philosophical Journal by Dr R. E. Grant, now Professor of Zoology in the University of London. He has succeeded in determining the functions of the pores, and the origin and mode of development of the ova.

Sponges consist of an albuminous skeleton and gelatinous matter, forming a mass not irritable, with numerous holes, connected internally with anastomosing canals. The skeleton is either simple, consisting of horny fibres, as the species so commonly used for domestic purposes; or compound, being strengthened by calcareous or siliceous spicula. The gelatinous matter, abounding in transparent globules, connects the different parts of the skeleton, lines the various canals, and forms the margins of the openings. The *pores* are minute openings with a gelatinous margin, strengthened or defended by the skeleton or spicula, into which the water enters in currents, generated probably by a ciliary apparatus which has not yet been perceived by the microscope. The water, after traversing the interior canals, is ejected by means of *orifices*, which are larger than the pores, and in many species are elevated above the surface, in the form of perforated papillæ. The ova are numerous, at first appearing like groups of minute, irregular-shaped, opaque granules, derived from the gelatinous matter, which unite into ovate bodies, falling at maturity into the canals, and expelled by the orifices. These ova float in the water, and exhibit spontaneous motion by the rapid action of the ciliæ, which cover the anterior portion of the body, and at length attach themselves, and then expand into the forms of maturity.

The currents from the orifices are best exhibited by placing the recent animal in a shallow dish of water, and throwing a little powdered chalk on the surface, the motions of which will indicate the direction of the streams. For the purpose of examining the skeleton, it is requisite to macerate the sponge in hot water, which removes the gelatinous matter, and leaves the remainder in a state fit to be examined under a microscope. When the spicula are siliceous, the animal matter may be removed by nitric acid or by combustion, as was practised by Muller (Zool. Dan. t. lxxxv.), when the vitreous needles will appear unaltered. In examining cabinet specimens of sponges, care must be taken to make allowance for the degree of maceration they may have undergone, as, upon this circumstance, their porosity, friability, or softness depend.

GEN. XLII. TETHYA.—Hemispherical, with numerous fibres radiating from the centre to the surface, and consisting of linear, fusiform, siliceous spicula.—An intermediate genus between *Cydonium* and *Halichondria*.

91. T. *cranium.*—Surface regular and closely villous.

Alcyonium cranium, *Mull.* Zool. Dan. t. lxxxv. f. 1.—A. Lyncurium, *Jameson*, Wern. Mem. i. 563.—Spongia pilosa, *Mont.* Wern. ii. 119, t. xiii. f. 1, 2.—Adheres to stones in deep water, Zetland, where it is termed *Sea-Apple.*

Hemispherical; one or two inches in diameter; attached by a flat, soft base; pale green, with a tinge of yellow; when fresh, it exhales an offensive ammoniacal odour; the surface is nearly smooth, but by drying it becomes villous, and when worn a little, muricate by the extremities of the bundles of fibres; the fibres decrease in size from the circumference; the spicula are long, of unequal lengths, fusiform, and where they reach the centre they are extremely fine, forming a dense, villous nucleus; the animal matter separating the fibres is small in quantity; from the arrangement of the fibres a horizontal section may be easily made, while a vertical one cannot be effected without difficulty.

92. T. *sphærica.*—Surface thickly covered with tubercles destitute of hairs.

Donati, Mer Adriat. 62, t. x. f. 1.—Alcyonium Lyncurium, *Linn.* Syst. i. 1295.—Spongia verrucosa, *Mont.* Wern. Mem. ii. 117, t. xiii. f. 4, 6.—Coast of Devon.

Diameter about an inch and a quarter; "globose, of a yellowish colour, extremely verrucose, and fleshy, which becomes very hard by drying, and is of considerable gravity even in that state; the warts on the surface are approximating, irregular in shape, and destitute of any pore; the internal part or nucleus is composed of fasciculate fibres, connected by the animal gluten; these fill the whole internal cavity, and radiate to the centre, appearing like threads of asbestus."—*Mont.*

GEN. XLIII. HALICHONDRIA (Χαλις *silex*, and Χονδρος *cartilago*).—Porous, the cartilaginous skeleton strengthened by siliceous spicula; form various.

* *Inhabiting the Sea.*

93. H. *papillaris.*—Encrusting; orifices large, subtubular, with entire smooth margins; pores villous; the spicula fusiform, slightly curved.

Spongia informis durior, compressa, *Ray*, Syn. Stirp. 30.—Crumb of Bread Sponge, *Ellis* (Coral. 80, t. xvi. f. *d.*), Phil. Trans. 1765, t. x. f. A.—Cock's-comb Sponge, ib. t. xi. f. G.—Spongia panacea and papillaris, *Pallas*, El. Zooph. 388, 391.—S. cristata and urens, *Sol.* Ellis. Zooph. 186, 187.—S. compacta, *Sower.* Brit. Misc. i. 45, t. xliii.—S. tomentosa and cristata, *Mont.* Wern. Mem. ii. 99. and 103.—S. papill. *Grant*, Edin. New Phil. Journ. ii. t. ii. f. 21.—Encrusting rocks and the stalks of the larger fuci, very common.

Crust about a quarter of an inch thick, yellow, uniform, with regular tubular orifices where growing in a sheltered situation, but uneven where exposed, the orifices short or elevated on crest-like ridges; the canals are numerous and wide; when dry, the sponge is friable, not unlike the crumb of bread; when heated to destroy the animal matter, the remaining spicula, if rubbed on the skin, excite a painful itching. The ova make their appearance in spring.

94. H. *panicea.*—Substance spreading, dense, surface even, the orifices large, rather imbedded; spicula short, cylindrical, obtusely pointed at one extremity, rounded at the other.

Spongia panicea, *Grant*, Edin. New Phil. Journ. i. 347; ii. t. ii. f. 4.—On rocks.

Crust extended sometimes an inch in thickness; when dried, the surface is flat and very porous, and the orifices, which are rather sunk, have irregular margins, and the divisions of the interior canals being usually visible, give the openings a stellular aspect. When dry, it is remarkably friable. I am inclined to consider this species as the *S. fava* of Montagu, Wern. Mem. ii. 115. He says, "This sponge, though harsh to the feel, yields to the pressure of the finger nail without elasticity; when recent is orange-yellow, and full of gelatinous flesh, but when exposed for a time on the shore, and the fleshy parts decayed and washed out, the pores are observed to be roundish. When examined by a lens, has a slight resemblance to a honey-comb; the pores, however, are not regular in size. If taken fresh and artificially dried, the pores are greatly obscured by the contracted gluten, and the colour becomes of a dark brown. If it has undergone a natural decomposition of the more perishable parts on the sea-shore, by the conjoined action of the water and the air, the pores are cleared, and it retains a light yellowish colour. A specimen in this state before me, is flat and broad; round the edges (which appear to have been broken) there are many large round openings intersecting the smaller pores, and communicating with those on the flat surfaces. This piece is three inches long, two broad, and about half an inch thick.

95. H. *parasitica.*—Substance rather loose, harsh to the feel, and somewhat brittle; spicula slightly curved, and pointed at one extremity.

Mont. Wern. Mem. ii. 114.—Investing fuci and corallines, not uncommon.

Surface rough, with the extremities of fasciculated spicula; pores angular, unequal; orifices scattered, slightly elevated, with the margins not thickened.

96. H. *cinerea.*—Three inches long and one broad, circular, a little depressed; pores minute, unequal; orifices scattered, few, spicula short, curved, and double pointed.

Spongia cin. *Grant*, Edin. New Phil. Journ. ii. t. ii. f. 3.—On rocks, Frith of Forth, rare.

About half an inch thick, blackish-grey, the surface smooth, convex, fleshy and transparent.

97. H. *columbæ.*—Irregularly latticed by rounded inosculating branches; spicula double pointed and curved.

Spongia col. *Walker's* Essays, 126.—S. cancellata, *Sower.* Brit. Misc. i. 131, t. vi.—Icolumbkil, Dr Walker; Brighton, Mr Fellows.

Branches about a quarter of an inch thick; pores minute, angular; the orifices, seated chiefly at the union of the branches, are conical, wide, with the margins not thickened. As this species is different from either the *S. cancellata* of Gmelin or Lamarck, I have ventured to change the name, imposed by Mr Sowerby, for the term employed by Dr Walker, in the conviction that the sponge referred to by both is identical.

98. H. *sanguinea.*—Colour deep blood-red, encrusting; spicula long, curved, single-pointed.

Spongia sanguinea, *Grant*, Edin. New Phil. Journ. ii. t. ii. f. 9.—Shores of the Hebrides.

Crust on the under surface of exposed rocks, sometimes six inches in diameter, and with a thickness of more than half an inch; general surface flat, with small rounded elevations and depressions, in the latter of which the small orifices are usually placed; pores minute; slimy.

99. H. *hirsuta*.—Crust very thin, with long projecting spicula.

Sponge, *Cordiner's* Ruins, No. 24, f. *e*. E.—On Escharæ from deep water, coast of Banff and Zetland.

Base when dry very thin, granular, with long single-pointed spicula, the surface hirsute with the projecting free extremities. Cordiner represents some of the spicula as triradiate, a circumstance which I have not observed in my Zetlandic specimen.

100. H. *suberica*.—Crust compact, pores very minute; spicula fusiform and slightly curved.

Spongia suberica, *Mont.* Wern. Mem. ii. 100.—On old univalve shells, Devonshire.

Crust tough, the pores scarcely visible, yellow; it is more dense in its substance, the spicula are smaller, and the fibres less interwoven than *H. papillaris;* besides, there are no orifices on the surface. I have found this species encrusting Corallines in the Frith of Forth.

101. H. *fruticosa*.—Fibres distant, nearly smooth, forming by their junctions large irregular meshes; spicula linear, obtusely pointed at one extremity.

Sponge, *Cordiner's* Ruin's, No. 7. f. *d*, D.—S. frut. *Mont.* Wern. Mem. ii. 112. t. xiv. f. 3, 4.—In deep water.

Irregular, cavernous, very loose in texture, and, from the largeness of the cells, very pervious to light; the fibres are crooked, and frequently throw out irregular processes, with scattered spicula on the sides and points.

102. H. *coalita*.—Branched in an irregular distorted manner; orifices tubular, small; spicula large, fusiform and curved.

Alcyonium ramosum molle, medullæ panis intus simile, *Ray*, Syn. Stirp. 31.—Spongia coalita, *Mull.* Zool. Dan. t. cxx. *Mont.* Wern. Mem. ii. 80.—Coast of Devon rare, Frith of Forth very common.

Growth very irregular, branches more or less compressed, frequently uniting; substance resembling *H. papillaris;* tubular processes sometimes occur on the sides of the branches, with small round orifices, It grows on dead shells or invests corallines, beyond low-water mark.

103. H. *hispida*.—Round, slender, hirsute, branches with tapering pointed subdivisions; spicula linear, coarse, and obtusely pointed.

Spongia hispida, *Mont.* Wern. Mem. ii. 81. t. v. f. 1, 2.—In deep-water on the coast of Devon.

The substance is hard, and the surface covered with stiff hairs; the branches are slightly divided; some of the spicula are slightly curved.

104. H. *Montaguii*. — Base sending out numerous erect branched tubes, the walls of which become very thin towards the extremity; spicula lengthened, fusiform.

Spongia tubulosa, *Mont.* Wern. Mem. ii. 91.—On stones at low-water, Kingsbridge, Devonshire.

Tubes smooth on the surface, their walls thick at the base, becoming thin as paper towards the orifice, and internally porous.—Montagu refers this species to the *Spongia tubulosa* of Ellis's Zooph. 188. t. lviii. f. 7, which differs in the presence of lateral tubes and firm elastic reticulations on the surface.

105. H. *ramosa.*—Soft, tough, erect branches, round or compressed, separate or confluent; with short double-pointed spicula.

> Spongia ramosa, *Ray*, Syn. Stirp. 29. *Ellis*, Coral. 80. t. xxxii. f. *f*. F. Phil. Trans. 1765, t. x. f. B. C. t. xi. f. 1.—S. oculata, *Pallas's* El. 390. —S. oc. and dichotoma, *Linn.* Syst. i. 1298.—S. oc. dich. and stuposa, *Sol.* Ellis's Zooph. 184. *Mont.* Wern. Mem. ii. 78. t. iii. iv. vi.—Hanging from the under surface of rocks about the low-water mark of spring tides.

The mode of drying determines the degree of softness of this species; the orifices are generally disposed on one side of the branches; there arise from a single stem, about a quarter of an inch in diameter, dichotomously divided branches; the arms long or short, round or compressed; sometimes the branches assume a fan shape, the spaces become filled up, and the whole appears palmate, with proliferous edges; the height seldom reaches a foot.—Instead of adopting these different forms, which are often connected with the same stem, as distinct species, as has been generally done by modern authors, I have preferred following Ray, in viewing them as varieties.

106. H. *palmata.*—Hard, tough, erect branches, with numerous raised orifices on the one side; spicula short, double pointed.

> Spongia pal. *Sol.* Ellis's Zooph. 189. t. lviii. f. 6. *Mont.* Wern. Mem. ii. 80.—In deep water on different parts of the coast from Devon to Zetland.

The stem rises from a spreading woody root, and is about an inch in thickness, it is irregularly branched, compressed, subpalmated, and upwards of a foot in height; the fibres have a centro-peripheral and distal direction; the pores are numerous, unequal, and angular; the orifices are confined to one surface, with the margins but little elevated.—This species is coarser in the texture, branches less regular, and inhabits deeper water, than the preceding, to which it is nearly related.

107. H. *ventilabra.*—Widely funnel-shaped or foliaceous, with woody veins; rough and brittle when dry; spicula long, linear and pointed.

> Sea-Fan Sponge, *Ellis*, Phil. Trans. 1765, 289. t. xi. f. H.—S. ventilabra, *Linn.* Syst. i. 1296.—S. ventilabra and Zetlandica, *Jameson*, Wern. Mem. i. 561.—S. vent. and sypha, *Mont.* Wern. Mem. ii. 105. t. xv. f. i.—In deep water on the Scottish coast; in Zetland termed Ling-hoods.

This sponge is extremely variable in form, forming an entire cup, becoming shallower with age, of upwards of a foot in diameter; or with a cup divided into irregular lobes at the margin, or split, and exhibiting a fan-shaped leaf; the base, by which it adheres to stones, is solid, and the stem is very short; the substance is thick at the base, becoming thinner towards the margin; when old, the central part thickens, becomes reticular, with a brittle exterior covering, which may be rubbed off, leaving a skeleton not unlike some *Gorgoniæ;* the pores are of various sizes, those on the inside of the cup or leaf are larger and less angular than the external ones; the spicula are numerous, and much matted; the gelatinous matter abounds in the young portions, especially towards the margin, and produces a cracked surface when drying.

108. H. *infundibuliformis.*—Widely funnel-shaped, thin, uniform, and brittle; spicula long, linear, and pointed.

Spong. inf. *Linn.* Syst. i. 1296. *Jameson*, Wern. Mem. 562.—Northern Islands rare.

Body cup-shaped, when dry tender; nearly of uniform thickness; the pores are not half the size of the preceding [species, the substance is softer, and the spicula shorter and less matted.

** *Inhabiting fresh water.* Spongilla *of Lamarck.*

109. H. *fluviatilis.*—Soft, brittle, and slenderly fibrous when dry; spicula linear and doubly pointed.

S. fluv. *Linn.* Syst. i. 1299.—Pallas, *El.* 384.—S. friabilis, *Grant*, Edin. Phil. Journ. xiv. 270.—In rivers and lakes.

Massive, with the surface rising into narrow ridges or pointed branches; sometimes slenderly branched and acuminated (then constituting the *S. canalium* of Gmelin; *Flem.* Phil. Zool. ii. 614. t. v. f. 4.) The fibrous structure very obvious, the fibres fine, and diverging from the centre; pores small.

110. H. *lacustris.*—Hard, brittle, and coarsely fibrous; spicula linear, and doubly pointed.

S. lac. *Linn.* Syst. i. 1299. *Don's* Animals of Forfarshire, 36.—In lakes in Angus and Fife.

Massive, rising into short rounded branches; the fibres are coarser, and the substance denser than the preceding; the spicula, too, though similar in form, are thicker, and about one-fourth shorter. It is difficult to determine the true place of the two fresh water Sponges noticed by Ray, under the titles "Spongia ramosa fluviatilis" and "Spongia fluviatilis ramosa fragilis." —Syn. Stirp. 30.

GEN. XLIV. SPONGIA.—Porous, the cartilaginous skeleton simple, or destitute of earthy spicula.

111. S. *pulchella.*—Massive, irregular, consisting of finely reticulated simple fibres.

Sower. Brit. Misc. t. xliii.—Southern and western coasts.

The texture is open, pervious to the light, the surface muricated by the free extremities of the fibres; these have an ascending direction, and frequently anastomose, forming irregular meshes.

GEN. XLV. GRANTIA.—Porous, the cartilaginous skeleton strengthened by calcareous spicula. I have ventured to dedicate this genus to Dr Grant, to commemorate his valuable services in elucidating the physiology of sponges, already referred to.

112. G. *compressa.*—Subtubular, compressed, with simple, terminal, and lateral orifices; spicula of two kinds, triradiate and clavate.

Spongia comp. *Fab.* Fauna Groen. 448.—S. foliacea, *Mont.* Wern. Mem. ii. 92. t. xii.—S. comp. *Grant*, New Edin. Phil. Journ. i. 166.–ii. t. ii. f. 11, 12, 13–23.—On the under side of rocks near low water-mark, common.

Length seldom above an inch, white, ovate, and of uniform thickness throughout. The external surface is crowded with numerous spicula, thick, and bent at one end, tapering to the other; the pores on the inner surface are larger, and the spicula triradiated; besides these two well-marked forms of spicula, there are others linear, pointed, and of unequal lengths.—It is probable that the radiated spicula of this or the following species constitute the *Asterias* of Walker, Test. Min. t. iii. f. 90.

113. G. *botryoides.*—Tubular, branched, inosculating, with subclavate terminal simple orifices; spicula triradiated.

Spongia bot. Sol. *Ell.* Zooph. 190. t. 58. f. 1–4.—S. complicata, *Mont.* Wern. Mem. ii. 97. t. 9. f. 3, 4.—At the roots of fuci, about low water-mark, not uncommon.

Branches in tufts, of a white colour, round, in some places adhering; externally the triradiated spicula are numerous; internally they are few, and the pores more obvious. The late Mr Montagu, to whom I communicated specimens of this species, having employed lenses with very weak magnifying powers, did not detect its peculiar spicula, and was in consequence led to constitute a spurious species.

114. G. *ciliata.*—Tubular, slightly contracted towards the terminal aperture, the margin of which is ciliated.

Spongia cil. *Fab.* Fauna Groen. 448.—S. cornata, Sol. *Ell.* Zooph. 190. t. lviii. f. 89. *Mont.* Wern. Mem. ii. 88.—On fuci, near low water-mark, not uncommon.

About half an inch in length, and ⅛th in thickness; the surface is closely covered with linear pointed spicula, having a terminal direction; in the substance of the sponge, besides these linear, there are other triradiated spicula. The internal surface is full of irregularly shaped pores.

115. G. *pulverulenta.*—Ovate, thick, pulverulent, villous.

Spongia ananas, var. *Mont.* Wern. Mem. ii. 97. t. xvi. f. 3.—On corallines, rare.

The substance of this species is thicker than the preceding, and the linear spicula on the surface are longer and more crowded; Montagu found his specimens on *Cellaria scruposa*; mine were obtained from *Sertularia cupressina* Zetland.

116. G. *nivea.*—Sessile, encrusting, with minute pores and circular orifices; spicula triradiate and quadriradiate.

Spongia nivea, *Grant*, New Edin. Phil. Journ. i. 168–11. t. ii. f. 14, 15, 16.—Under surface of sheltered rocks, Prestonpans Bay, Frith of Forth.

Crust in patches, one or two inches in diameter, and about two lines in thickness; the orifices are slightly elevated, thickened at the base, and very thin towards the margin; spicula unequal, the side-arms of the quadriradiate ones usually short.

Sponges, the situation of which in the three preceding genera is doubtful.

1. S. *digitata.*—" With very slender, dichotomous branches, digitated at

their summit; tne surface granulated."—*Mont.* Wern. Mem. ii. 84. t. vii.—Deep water, Devonshire.

2. S. *ramosa.*—" Palmated, and digitated round the top."—ib. 84. t. viii.–ib.

3. S. *conus.*—" With numerous, short, flattish divarications issuing from the sides."—ib. 85. t. x.—ib.

4. S. *lobata.*—" With clustered, ovate divarications."—ib. 85. t. ix.—ib.

5. S. *perlævis.*—" Form indeterminate, texture close, surface covered with obtuse papillæ."—ib. 86. ib.

6. S. *aurea.*—" Broad, flat, and slightly divided at the top. ib.—86.

7. S. *rigida.*—" With obtuse spreading, irregular flattish divarications, arising from the same base; usually a short stalk."—ib. 87. t. xi. f. 1, 2.—ib.

8. S. *penicellus.*—" With a yellowish gelatinous base, supported by internal spicula, and having on its surface white flexible spongy tubes."—ib. 93. t. xiii. f. 7.—ib.

9. S. *lævigata.*—" Soft, compressible and elastic; texture extremely fine, and reticulated."—ib. 95. t. xvi. f. 4.—ib.

10. S. *ananas.*—" Ovate, rugous, tubular, the summit crowned with spines surrounding the aperture."—ib. 36. t. xvi. f. 1, 2.—ib.

11. S. *limbata.*—" With the fibres formed into larger and smaller circular pores, resembling lace."—ib. iii. t. xv. f. 2, 3.—ib.

12. S. *fragilis.*—" Fragile, friable, coarsely reticulated; the fibres rugose, as if covered with minute sand."—ib. 114. t. xiv. f. 1, 2.—ib.

13. S. *plumosa.*—" Irregular, rather soft and tough when deprived of its gelatinous flesh, somewhat resembling compressed tow."—ib. 116.—ib.

14. S. *coriacea.*—" Shape indefinite, wrinkled, and cavernous, not unlike a piece of burnt leather."—ib. 116.

EXTINCT SPECIES.

1. S. *ramosa.*—Thinly branched; nearly cylindrical.—*Park.* Org. Rem. ii. 91. t. vii. f. 12.—*Mant.* Geol. 162. t. xv. f. 11.—In *Chalk.*

2. S. *lobata.*—Irregularly subcylindrical rounded lobes.—*Park.* Org. Rem. 92. t. vii. 6.—In *Chalk.*

3. S. *Townsendi.*—Cyathiform, containing a conical cavity; substance porous; base enlarged, with diverging processes of attachment.—Wiltshire, Alcyonite, *Park.* Org. Rem. ii. 125. front.—Spongus Town. *Mant.* Geol. 164. t. xv. f. 9.—*Chalk.*

4. S. *hemisphærica.*—Hemispherical turbinated, or subcylindrical; the superior surface marked with flexuous depressions; base perforated.—Spongus lab. *Mant.* Geol. 160. t. xv. f. 7.—In *Chalk.*

5. S. *radiatus.*—Funnel-form; externally with cylindrical, diverging, anastomosing fibres; meshes elongated; internally with perforated papillæ.—Ventriculites radiatus, *Mant.* Geol. 168. t. x.—In *Chalk.*

6. S. *alcyonoides.*—Conical or disciform; meshes circular.—Alcyonite, *Park.* Org. Rem. ii. 213. t. x. f. 12.—Ventriculites alcyon. *Mant.* Geol. 176.

7. S. *quadrangularis.*—Inversely conical cyathiform; quadrangular; the meshes very minute.—Ventriculites quad. *Mant.* Geol. 177. t. xv. f. 6.—In *Chalk.*

8. S. *Benettiæ.*—Inversely conical; hollow externally; the meshes are oblong, irregular, and rather distant; internally with circular depressions; margin broad, smooth, and nearly flat.—Ventriculites Ben. *Mant.* Geol. 177. t. xv. f. 3.—In *Chalk.*

9. S. *subrotundus.*—Depressed, subrotund; central cavity small; external surface smooth.—Choanites sub. *Mant.* Geol. 179. t. xv. f. 2.—In *Chalk.*

10. S. *flexuosus.*—Cyathiform; margin of the central depression marked with flexuous indentations; radical processes long and fibrous.—Choanites flex. *Mant.* Geol. 179. t. xv. f. 1.—In *Chalk.*

11. S. *Konigii.*—Inversely conical; externally marked with irregular fibres, some of which penetrate the substance, and terminate in openings on the inner surface; central cavity cylindrical, deep, narrow; base fixed by radical processes.—Choanites Kon. *Mant.* Geol. 179. t. xvi. f. 19.—In *Chalk.*

Many other species are obscurely announced in *Park.* Org. Rem. ii. (1.) p. 95. t. ix. f. 4.; (2.) p. 100. t. ix. f. 1.; (3.) p. 130. t. xi. f. 4.; (4.) p. 132. t. xii. f. 5.; (5.) p. 133. t. xii. f. 7.; (6.) p. 102. t. ix. f. 9.

The resemblance of these fossil bodies to the recent species of sponges is very considerable, and would justify any one acquainted with the structure of the latter, to refer the whole to the genus *Halichondria.* The forms of the recent species, however, are variable, and the utmost caution is requisite in establishing species founded on so vague a character. Yet Dr Mantell, otherwise a sagacious geologist, has not hesitated to adopt two new genera, *Ventriculites* and *Choanites*, depending on the *form* of the substances contemplated, and to which, while recent, he has, in the absence of all proof, somewhat incautiously, assigned an expansive and contractile power. It is interesting to observe the remains of the radiated siliceous spicula yet preserved in stone, as has been demonstrated by Mr Parkinson, in his Org. Rem. ii. 95. t. vii. f. 8.

CELLULIFERA.

A. *Substance rigid, stony.*

I. Cells in the form of minute pores, imbedded. MILLEPORADÆ.
Millepora.

II. Cells tubular, and produced beyond the surface. TUBIPORADÆ.
Tubipora.
Favosites.
Tubulipora.
Discopora.
Filipora.
Terebellaria.

III. Cells utricular, adjacent, or superimposed. ESCHARADÆ.
Eschara.
Retepora.
Cellepora.
Berenicea.
Hippothoa.
Alecto.

A. A. *Substance flexible.* FLUSTRADÆ.
Farcimia.
Flustra.

MILLEPORADÆ.

GEN. XLVI. MILLEPORA.—Pores very minute, perpendicular to the surface, giving the interior a finely striated fracture; form irregular.

117. M. *lichenoides.*—Subincrusting, with semicircular plates, variously united; minute pores on the under side.

Corallium cretaceum, lichenoides, *Ellis*, Coral. 76. t. xxvii. f. d. D. *Borl.* Corn. 239. f. 2, 5.—*Mill.* lich.—*Sol.* Ell. Zooph. 131. t. 23. f. 10, 12.—English coast.

Variously shaped, sometimes hemispherical; when young it is extremely thin and brittle, in which state it seems to be the *Corallina auriculariæformis* of *Sower.* Brit. Misc. t. lvi; the semicircular plates are of various sizes, and constantly grow horizontally; their margins bend over, which makes them convex on their upper side, and concave underneath.

118. M. *polymorpha.*—Irregularly ramose, tuberculated, or incrusting.

Corallium album pumilum nostras, *Ray*, Syn. Stirp. 32. *Ellis*, Coral. 76. t. xxvii. f. C.—M. pol. *Linn.* Syst. i. 1285.—Common on submarine rocks, in shallow water.

When young, this species appears in thin irregularly circular patches, apparently constituting the genus *Melobesia* of Lamouroux; on shells and fuci; it usually continues a thin crust of a purple colour; on rocks it thickens, forming irregular lobes, spreading tubercular masses, or rising into irregular short branches.

EXTINCT SPECIES.

1. M. *ramosa.*—Dichotomously branched, cylindrical; pores visible by a lens, of unequal size.—*Park.* Org. Rem. ii. 71. t. viii. f. 3.—*Limestone*, Wiltshire.

TUBIPORADÆ.

GEN. TUBIPORA.—Tubes cylindrical, erect, parallel, separate, connected by transverse plates or tubes.

1. T. *catenata.*—Tubes approximate, each emitting from its sides distant, horizontal, tubular branches, which enter the surrounding tubes, and unite the whole into one irregularly formed mass.—*Mart.* Pet. Derb. t. xlii. *Park.* Org. Rem. ii. 13, t. i. f. 1.—*Carboniferous Limestone.*

2. T. *strues.*—Tubes diverging, bending, united by horizontal tubular branches.—*Park.* Org. Rem. ii. 16, t. ii. f. 1.—*Oolite.*

3. T. *ramulosa.*—Tubes connected by oblique, dichotomous ramifications. *Park.* ii. 18, t. iii. f. 1.—*Carboniferous Limestone.*

4. T. *radiatus.*—Tubes distant, erect, parallel, striated, and connected by transverse plates, the surface of which is marked with radiated undulated striæ.—*Mart.* Pet. Derb. t. 18.—*Carboniferous Limestone.*

GEN. FAVOSITES.—Massive, consisting of ascending, parallel, adjacent, prismatical tubes.

1. F. *septosus.*—Hemispherical, nearly 2 inches in diameter, the tubes radiating from the centre irregularly, divided internally by simple transverse plates.—*Carboniferous Limestone.*

2. F. *depressus.*—An extended plate, about an inch in height, tubes vertical, rather smaller than the preceding, and less divided.—*Carboniferous Limestone.*

GEN. XLVII. TUBULIPORA.—Branched, cells cylindrical, tubular.

119. T. *serpens.*—Stem flat, branches narrow, ascending, striated on the back; the tubes disposed on both sides of the front, and united in transverse rows.

Eschara millepora, *Ellis*, Coral. 74, t. xxvii. f. E.—Tubipora serpens, *Linn.* Syst. i. 1271.—Millepora liliacea, *Pall.* El. 248.—Millepora tubulosa, *Sol.* Ell. Zooph. 136.—On corallines, common.

The whole mass seldom exceeds half an inch in length, or the tenth of an inch in breadth; the tubes, though usually united at the base, have the orifices free, and even in some cases are disjoined throughout; a groove, destitute of cells, winds along the middle of the stem and branches; the colour when recent has a purplish tinge.

120. T. *truncata.*—Stem round, branched, ending with en-

larged globular heads, radiated with plates of united vertical cells.

In deep water, Zetland.

About an inch in height, the branches scarcely exceeding one-eighth; the branches are short, pierced by numerous pores, the openings of cells converging towards the centre; the head is stellate, the rays are highest in the middle of their course, diminishing towards the centre and lower margin of the head; each ray is compressed, and consists of two rows of tubular cells, united, crowded, with subangular orifices; the tubes have a central direction, and give to the sides of the plates a striated appearance. This species has probably been referred to as an inhabitant of the north seas, under the title of *Millepora truncata*, but it differs widely from ths *Myriozoos* of Donati, to which the term was restricted by Pallas.

GEN. XLVIII. DISCOPORA.—A subcircular crust, adhering in the middle, circumscribed, and raised at the margin, forming a cup, bearing on the inside a disc of tubular cells.

121. D. *verrucaria*.—Margin thin, concentrically wrinkled, disc with the centre nearly smooth, the tubular cells diverging and submarginal.

Madrepora verrucaria, *Linn.* Syst. i. 1272. *Pallas*, El. 280.—Millepora verr. *Sol.* Ellis Zooph. 137.—On fuci and corallines, common.

About a quarter of an inch in diameter; the centre is generally punctured with the traces of the obliterated rays, the tubes are sometimes slightly cohering, and disposed in rays; the orifices are round and simple.

122. D. *hispida*.—Margin thin and waved, the cells distri buted or radiated, with denticulated orifices.

Coral resembling the cups and foliage of flowers, *Cordiner's* Ruins, No. xxii.—On corallines from deep water, Zetland.

Breadth nearly an inch; hispid, the cells seem distributed over the whole surface, and more vertical than the preceding; there are, however, waved porous grooves, and the cells seem disposed on each side of these in irregular transverse rows, united or free, short, with expanding orifices, dividing into irregular spinous processes. This species is very common in Zetland, adhering to *Cellepora cervicornis*, and the figure of Cordiner is a tolerably accurate representation. He does not, however, state his examples as Scottish.

GEN. XLIX. FILIPORA.—Massive, consisting of numerous long, cylindrical, linear tubes, slightly branched, variously united and twisted.

123. F. *filograna*.—Tubes about $\frac{1}{50}$th of an inch in diameter, fasciculating and twisting, forming large irregular meshes.

Serpula filograna, *Linn.* Syst. i. 1265.—S. corallifica, *Pallas*, El. 239.—Common on old shells and the roots of fuci a little beyond low water-mark.

The masses sometimes occur upwards of a foot in diameter; the tubes are slightly wrinkled transversely, and nearly of equal size throughout, except where divided; the colour is white.

GEN. TEREBELLARIA.—Branched, spirally twisted; pores tubular, disposed spirally.

1. T. *ramosissima.*—Branches numerous, divaricated, nearly cylindrical, obtuse.—*Lamouroux*, Zooph. 84, t. lxxxii. f. 1. Geol. Eng. 214.—*Oolite.*

ESCHARADÆ.

GEN. L. ESCHARA.—Frondescent, with a single layer of cells on each side.

124. E. *retiformis.*—Plates broad, winding, uniting irregularly.

Ray, Syn. Stirp. 31.—E. foliacea, *Ellis*, Coral. 71, t. xxx. f. 3. *Borl.* Corn. 239, t. xxiv. f. 6.—Millepora fascialis, *Linn.* Syst. i. 1283.—English coast.

In masses from a few inches to upwards of a foot, formed, by the union of the plates, into irregular cavities; surface rough, the orifices of the cells are round, usually with a blunt tooth on one side, the intervening spaces rough.

125. E. *fascialis.*—Expansions narrow, compressed, branched, occasionally united.

Italian coral, *Ellis*, Coral. 72, t. xxx. f. 6.—E. fasc. *Pallas*, El. 43.—English coast.

This chiefly differs from the preceding in being branched, and the divisions being flat and narrow. In the opinion of Pallas it is only a variety.

GEN. LI. RETEPORA.—Expanded, with regular openings, forming a net-work; cells on the upper side.

126. R. *reticulata.*—Rough on both sides, the divisions rounded; the cells with the orifices declining, and protected by a spinous process on the central margin.

Millepora retepora, *Borl.* Corn. 239, t. xxiv. f. 8.—M. reticulata, *Linn.* Syst. i. 1284. *Fab.* Faun. Gr. 433.—Coral, *Cordiner*, Ruins, t. No. 6.—In deep water.

Expanding to the extent of two or three inches; more or less cup-shaped, waved, uniting; the holes are oval, regular, the intervening spaces supporting two or three pores in oblique rows. This species is very distinct from the *R. cellulosa*, with which it has been confounded.

* * *

EXTINCT SPECIES.

1. R. *flustriformis.*—Form unknown, spreading; holes suboval, the walls striated and porous.—Millepora flust. *Mart.* Pet. Derb. t. xliii. f. 1, 2.—*Carboniferous Limestone.*

2. R. *elongata.*—Holes quadrangular lengthened, unequal.—Fan coral, *Ure*, Ruth. 329, t. xx. f. 3, 4.—*Carboniferous Limestone.*—The cast of the holes of these two species exhibits a file-like appearance.

GEN. LII. CELLEPORA.—Cells agglomerated, presenting various forms.

127. C. *pumicosa.*—Substance loosely cellular, the cells orbicular, the mouth round, with a produced marginal process.

Eschara millepora lapidea, instar pumicis porosa, *Ellis*, Coral. 75, t. xxx. f. D.—Millepora pumicosa, *Pallas*, El. 254—Flustra bullota, *Sol.* Ellis Zooph. 16.—Investing the stems of fuci.

When young the cells are remarkable for their rounded form, but they become less regular as they multiply gemmiparously, and are piled upon one another without order, when the mass bears a very close resemblance to pumice-stone.

128. C. *cervicornis.*—Branched, compressed, rough, mouths of the cells slightly marginated, with a blunt process on the upper side.

Porus cervinus Imperati, *Borl.* Corn. 240, t. xxiv. f. 7.—Millepora cerv. *Pall.* 252.—M. compressa, *Sower.* Brit. Misc. t. lxi.—In deep water, not rare.

Stem rising to the height of several inches, dichotomously divided, the branches spreading; rough, with the half formed cells; the extremities of the branches are compressed, even, and thin, consisting of a single layer of cells on each side regularly placed. In this state it accords with the *Millepora Skenii* of *Sol.* Ellis, Zooph. 135. It afterwards increases irregularly in thickness, becoming rounder. It is of a pale brownish colour, and looks sometimes as if varnished.

129. C. *palmata.*—Base round, suddenly expanding on each side into a compressed, slightly divided head, the cells with a tooth on the proximal margin.

A single specimen from deep water, Zetland.

Height about half an inch, breadth an inch, stem about two-tenths; rough, the little branches are short and truncated; the orifices of the cells are declining, and nearly concealed by the spinous processes, which are rather long, and give the surface a muricated aspect; the substance is somewhat compact.

130. C. *lævis.*—Dichotomously branched, cylindrical, the pores wide, with simple mouths.

A single specimen from deep water, Zetland.

Height an inch and a quarter, diameter one-tenth; the branches are smooth, with the orifices of the cells smooth and concave; towards the extremities the branches are rough with the forming cells, and the orifices are more declining, circumscribed, a little prominent, with a blunt process at the proximal margin.

131. C. *ramulosa.*—Dichotomously branched, the branches round and confluent; cells prominent, with a produced spinous process on the proximal margin.

Linn. Syst. i. 1285.—Millepora pumicosa var. *Sol.* Ellis, Zooph. 136. *Cordiner's* Ruins, No. xiv.—In deep water, not rare.

Height of the largest specimen in my possession about an inch and a half, the thickness of the branches scarcely a line, and their length less than half an inch; the surface is rough with the long stout spinous processes; it is brittle, light, and usually of a white colour.

EXTINCT SPECIES.

1. C. *Urii.*—Branched, round, about a quarter of an inch in diameter, form round.—Millepore, *Ure*, Ruth. 228, t. xx. f. 1.

GEN. LIII. BERENICEA.—Cells united in a spot-like crust, adhering throughout, and not circumscribed; mouth at the distal extremity of the cells.

132. B. *coccinea.*—Cells subcylindrical, adjacent, in divergingly bifid rows; mouth wide, a single blunt tooth on the outer margin, and two or three spines on the inner.

Cellepora coc. *Mull.* Zool. t. clxvi. f. 1, 2.—Discopora bispinosa, *Johnston*, Edin. Phil. Journ. xiii. 222.—On the under side of stones near low water-mark.

Occurring in circular patches upwards of an inch; towards the centre it is commonly rough with the ovaria; the surface of the cells looks as if frosted, though glossy.

133. B. *hyalina.*—Diaphanous, the cells forming an even, smooth crust, with tubular simple mouths.

Cellepora hyal. *Linn.* Syst. i. 1286.—On stones, shells, and corallines from deep water.

The crust is semitransparent, the divisions of the narrow cells indicated by whitish lines, and the orifices are narrow, cylindrical, simple tubes. The crust is not circumscribed, otherwise it resembles the genus *Discopora.*

134. B. *immersa.*—Cells forming an even, rough crust; the mouths declining, small, with a blunt tooth on the proximal margin.

On shells and corallines from deep water.

Crust rather thick, of a brownish colour; the divisions of the cells indistinct, the cells themselves being only a little elevated towards the aperture; the whole surface minutely granular.

135. B. *utriculata.*—Cells bladder-shaped, sitting, aperture with five or six teeth, the proximal one the largest.

On stones and shells from deep water.

The cells appear as unconnected, though adjacent, raised, rounded, the mouth scarcely terminal, restricted, contracted, and slightly prominent.

136. B. *nitida.*—Cells subcylindrical, prominent, and transversely ridged.

Cellepora nit. *Fab.* Faun. Gr. 435.—On shells, rare.

Cells contiguous, the mouth terminal, transverse, simple.

EXTINCT SPECIES.

1. B. *diluviana.*—Cells pyriform, openings large.—*Lamour.* Zooph. 81. t. lxxx. f. 1. Geol. of Eng. 214.—In *Oolite.*

GEN. LIV. **HIPPOTHOA.** — Crust adherent, interrupted and reticulated by branching and coalescing chains, formed of lengthened cells, united with each other at the extremities.

137. H. *catenularia.*—Cells rounded anteally, tapering to the other extremity, aperture oval.

Tubipora catenularia, *Jameson*, Wern. Mem. i. 561 ?—On shells in deep water, not uncommon.

This species differs from the *Hippothoa divaricata* of Lamouroux (Zooph. 82. t. lxxx. f. xv.), in the superior size and width of the cell at the anterior extremity; the margin of the mouth is slightly thickened and elevated; the branches proceed nearly at right angles, issuing from the margin beside the mouth.

GEN. **ALECTO.**—Adherent cells, nearly cylindrical, united with each other at the extremities, and disposed in forked branches.

1. A. *dichotoma.*—Filiform, mouth near the anterior extremity of the cells. *Lamour.* Zooph. 84. t. lxxxi. f. 12.—Geol. Eng. 214.—In *Oolite.*

FLUSTRADÆ.

GEN. LV. **FARCIMIA.**—Ramose, branches cylindrical, jointed, with cells diverging from the axis.

138. F. *fistulosa.*—Dichotomous, joints lengthened, cylindrical, with lozen-shaped impressed cells.

Bugle coralline, *Ellis*, Coral. 46. t. xxiii.—Tubularia fistulosa, *Linn.* Syst. i. 1302.—Cellularia salicornia, *Pall.* El. 61.—Cellaria farciminoides, Sol. *Ellis*, Zooph. 26.—C. salicornia, *Lamouroux*, Cor. Flex. 126. —Various parts of the coast, from Devon to Zetland.

Height from two to three inches, diameter not exceeding the twentieth of an inch; the structure is tubular and proliferous; the spaces between the joints calcareous and brittle, the cells internally are arranged round the axis, sublongitudinally, opening by a small orifice towards the summit of the rhombic impression. Pallas states, as a proof of the rapid growth of this coralline, that he has seen specimens an inch and a half in height, growing on the egg of a shark, containing an immatured fœtus.

GEN. LVI. FLUSTRA.—Foliaceous or encrusting, cells contiguous, arranged in regular series, forming mat-like expansions; polypi fixed to the bottom of the cell, retractile; ovaria like pearly excrescences on the summits of the cells.

* *Foliaceous and branched, with cells on both sides of the leaves.*

139. F. *foliacea.*—Extremities rounded, cells narrow at the proximal, and arched at the distal, extremity, with scattered marginal denticles.

Fucus telam lineam sericeamve textura sua æmulans, *Ray*, Syn. Stirp. 42. —Eschara fol. *Ellis*, Coral. 70. t. xxix. f. 2.—Flustra fol. *Linn.* Syst. i. 1300.—Esch. fol. *Pall.* El. 52.—Common on hard ground, in a few fathoms water.

Height several inches, dividing irregularly, frequently palmate; the teeth on the margin of the cells are short conical processes, usually in pairs, on each side at the upper angles. The substance is rigid. Body of the animal is nearly twice as long as the cells, with about fourteen long slender tentacula.

140. F. *papyracea.*—Extremities hatchet-shaped; cells slightly enlarged distally, margins smooth.

Eschara pap. *Ellis*, Coral. t. xxxviii.—*Sol.* Ellis Zooph. 13.—T. chartacea, *Lamour.* Cor. 104.—English coast.

Height about two inches, irregularly divided; of a slender delicate texture, like thin semitransparent paper, and of a very light straw-colour. Is this species distinct from the preceding? A specimen sent me from the coast of Devon by Mr Montagu, as the species referred to by Ellis, had the cells of the same shape, with similar marginal denticles as *F. foliacea*, and only differed in being less rigid, a character not to be relied on.

141. F. *truncata.* — Strap-shaped, dichotomously divided, truncated at the extremities, with lengthened quadrangular cells, having smooth margins.

Fucus marinus scruposus albidus angustior compressus, extremitatibus quasi abscissis, *Ray*, Syn. Stirp. 43.—Narrow-leaved Horn-wrack, *Ellis*, Cor. 69. t. xxviii. f. 1.—F. trun. *Linn.* Syst. i. 1300.—Eschara securifrons, *Pall.* El. 56.—Common on hard ground, in a few fathoms water.

Height several inches; in some cases the branches are nearly of equal breadth throughout; in others, numerous leaves arise from the sides of the principal ones, which are at first narrow, but speedily reach their usual breadth, rendering the coralline proliferous. It is less rigid in its growth than *F. foliacea*, and smooth.

** *Foliaceous and branched, with cells confined to one side.*

142. F. *carbasea.*—Irregularly divided, flat, thin, cells numerous, oblong, narrow, and truncated at the base.

Sol. Ellis, Zooph. 14. t. cxi. f. 6, 7. *Lamour.* Cor. Flex. 104.—Coast of Scotland, where it was first observed by Dr David Skene of Aberdeen.

Height several inches; base destitute of tubular roots; leaves narrow at the base, increasing in breadth towards the slightly rounded extremity. The substance is thin and transparent, with a tinge of brown; smooth, from the absence of prominent denticles on the walls of the cells; dorsal surface glossy. Body of the animal cylindrical, head subglobular, surrounded by twenty-two tentacula of nearly equal thickness throughout, and about one-third of the length of the body. Ova produced singly in the cells, ovate and ciliated.—See a valuable paper by Dr Grant on the history of this species, in the Edinburgh New Philosophical Journal.

143. F. *setacea.*—Dichotomously divided, rounded dorsally, the face with two or three rows of oval cells, having a setaceous notched tooth.

F. Ellisii, *Flem.* Wern. Mem. ii. 251. t. xvii. f. 1.—Along with *Cellepora cervicornis*, from deep water, Zetland.

Height nearly two inches; branches linear, not the tenth of an inch in diameter; substance firm, brittle; the base consists of small tubes, which, by their union, form the branches; dorsally carinated by the union of the tubes, which, diverging to each side and dividing, form two denticles and a long bristle, the latter serrated on one side; cells oblique.

144. F. *avicularis.*—Dichotomously divided, flat, thin; cells in two, three, four, or five rows, with spines at the end.

Corallina cum appendiculis lateralibus avium capitum forma, *Ellis*, Coral. t. xx. f. 2., and t. xxxviii. f. 7.—Sertularia av. *Linn.* Syst. i. 1315.—Cellularia av. *Pall.* El. 68.—F. av. *Sower.* Brit. Misc. t. lxxi. Cellaria av. and Flustra angustiloba, *Lamk.* Hist. ii. 141. and 158.—Crisia av. and flustroides, *Lamour.* Cor. Flex. 141.—On various parts of the coast.

Height upwards of an inch; leaves narrow, slightly truncated; back smooth; sides denticulated with appendages from the middle of the cells, nearly resembling a parrot's head and bill, the rudiments of tubular processes; cells quadrangular, lengthened, with produced spinous processes at the sides or summit. In its young and most slender condition it has only two rows of alternate cells, in which state it has been considered a *Cellaria;* but, in the same branch we have observed the cells in two, three, or four rows. It is not rare in the Frith of Forth, and it likewise occurs in the Zetland seas.

*** *Spreading, adnate.*

145. F. *membranacea.*—Expansion with the margin undivided; cells quadrangular, lengthened, with spinous processes at the angles.

Linn. Syst. i. 1301. *Sol.* Ellis, Zooph. 18.—On broad-leaved fuci, common.

Encrusting uniformly the surface; rough; cells linear; the processes at the angles are blunt, and not equal to the breadth of the cell.

146. F. *unicornis.*—Expansion with the margin divided; cells ovate or subquadrangular, with a blunt hollow conical process at the summit of each.

F. membranacea, *Mull.* Zool. Dan. t. cxvii. f. 1, 2.—F. un. *Flem.* Edin. Phil. Journ. ii. 87.—Common, especially on stones, near low watermark.

The margins of the cells are a little thickened; the cells themselves are shorter and wider than the preceding species, with which it has hitherto been confounded.

147. F. *pilosa.*—Cells rather remote, nearly circular, the margin with numerous inflected teeth.

Eschara millepora, *Ellis*, Coral. 73. t. xxxi.—F. pil. *Linn.* Syst. i. 1301.—F. lineata, *Fab.* Fauna Groen. 437.—Common on fuci.

This species invests the stalks of narrow-leaved marine plants, and sometimes appearing as if foliaceous, with cells on both sides; the cells below are gibbous, and the intervening spaces are covered with pellucid points; the teeth vary in number, from six to eight, the one near the base is usually produced into a long simple hair, giving the whole a hispid appearance. When this long hair is absent, the coralline has been termed *Flustra dentata* (Sol. Ellis, Zooph. 15.), and is figured by Ellis (Phil. Trans. 1753, 631. t. xxii. f. 4.) with the base of the polypi tubular, and the head with twelve tentacula.

148. F. *hispida.*—Substance fleshy, cells remote, aperture contracted; armed at the top with spinous processes.

Fab. Faun. Groen. 438. *Jameson*, Wern. Mem. 563.—Investing *Fucus serratus*; every where common.

Substance thick, tough, full of mucus; brown; base of the cells, where attached, contiguous and angular; at the surface the cells are ovate, the aperture lunate; polypi with an enlarged head, and from twenty to thirty tentacula. The *F. hispida* of Pallas is a different species.

THECATA.

I. *Sheath slightly calcareous; cells single, or in rows.*

- 1. Sheath slightly calcareous, cells enlarged, in rows, united or single.—CELLARIADÆ.
  - *a.* Cells united.
    - *b.* Cells with the orifices opening on the upper surface.
      - Cellularia.
      - Tricellaria.
      - Crisia.
    - *bb.* Cells in pairs, attached by the back, the orifices with opposite aspects.
      - Notamia.
  - *aa.* Cells single.
    - Eucratia.
    - Anguinaria.

II. *Sheath membranaceous, cells enlarged externally and lateral.*—SERTULARIADÆ.

- I. Base of the cells broad, coalescing with the stem.
  - *a.* Cells on opposite sides of the stem.
    - Sertularia.
    - Dynamena.
    - Thuiaria.
  - *aa.* Cells unilateral.
    - Antennularia.
    - Plumularia.
    - Serialaria.
- II. Base of the cells narrow, or pedunculated.
  - Campanularia.
  - Valkeria.
  - Cymodocia.
- III. Sheath membranaceous, the cells are the simple extremities of the branches.—TUBULARIADÆ.
  - Tubularia.
  - Plumatella.

CELLARIADÆ.

GEN. LVII. CELLULARIA.—Cells in two rows, alternate, ovate, the openings with sessile margins; sides of the branches denticulated.

149. C. *fastigiata.*—Cells semicylindrical, slightly rounded at the top, with a blunt process at the summit on the outer side of each.

Corallina cellifera erecta, ramosissima; tenerrima, et plumosa, *Ellis*, Coral. 33. t. xviii. f. 1.—Sertularia fast. *Linn.* Syst. 1314.—C. plumosa, *Pall.* El. 66.—Crisia plumosa, *Lamour.* Cor. Flex. 143.—Not uncommon, beyond low water-mark.

Height several inches, dichotomously branched, upright, tufted, irregularly jointed; at the lower part invested with tubular radicles from the upper branches; the cells are rather narrow, with pearly ovaria on their upper part.

150. C. *neritina.*—Cells quadrangular, lengthened, with a truncated summit, the outer angle projecting.

Snail-bearing coralline, *Ellis*, Coral. 35. t. xix.—Sertularia neritina, *Linn.* Syst. i. 1315.—Cellularia neritina, *Pall.* El. 67.—Acamarchis nerit. *Lamour.* Cor. Flex. 135.—On the English coast.

Height several inches, dichotomously divided, spreading, the cells are narrow, rather diverging, and more than the half of the outer summit is free; the pearly, helmet-shaped ovaria, opening transversely, were at one time considered by Ellis as the young of Neritæ. I possess a specimen from the collection of the late Dr Walker, which he received from Miss Blackburne from the coast of Cheshire.

151. C. *Hookeri.*—Cells rounded, diverging, projecting.

Found by Dr Hooker at Torquay, 1812.

Height upwards of an inch, dichotomously branched, branches straight, stiff, brittle, divaricate; the cells are protuberant dorsally, and their rounded top is nearly free, projecting laterally, giving the edge a remarkably jagged outline, and the pearly ovaria are rounded.—I observed this species, in a collection of zoophytes obligingly presented to me by the celebrated individual to whom, as a mark of my respect and gratitude, I have inscribed it.

152. C. *scruposa.*—Cells oval, with a projecting, lateral, truncated, pointed wing.

Creeping stony Coralline, *Ellis*, Cor. 37. t. xx. f. 4.—Sertularia scrup. *Linn.* Syst. 1315.—C. scrup. *Pall.* El. 72.—Crisia scrup. *Lamour.* Cor. Flex. 139.—Adhering to corallines, common.

Height about an inch, creeping, and frequently sending out tubular radicles, dichotomously divided, branches rather broad; lateral process sometimes denticulated on the upper margin; pearly ovaria round, on the top of the cell.

153. C. *reptans.*—Cells inversely conical, rounded, projecting, with short spinous processes at the top.

Creeping Coralline, *Ellis*, Cor. 37. t. xx. f. 3.—Sertularia rep. *Linn.* Syst. Syst. i. 1315.—C. rep. *Pall.* El. 73.—Crisia rep. *Lamour.* Cor. Flex. 140.—Common on submarine bodies, especially *Flustra foliacea.*

Height upwards of an inch, creeping, dichotomously divided, branches diverging, jointed, with frequent connecting tubular radicles; the extreme branches free; the lateral projecting summits of the cells have from one to four short spines.

154. C. *ciliata.*—Cells remote, funnel-shaped, diverging, the summit with long hairs.

Ciliated Coralline, *Ellis*, Cor. 38. t. xx. f. 5.—Sertularia cil. *Linn.* Syst. i. 1316.—C. cil. *Pall.* El. 74.—Crisia cil. *Lamour.* Cor. Flex. 139.—On corallines and fuci, common.

Height seldom an inch, dichotomously branched, loose; cells projecting on the sides of the branches, mouths oblique, spines unequal.

GEN. LVIII. TRICELLARIA.—Cells ternate, with a joint above and below; mouths ovate, with sessile margins.

155. T. *ternata.*—Cells lengthened, rounded at top, with spinous processes.

Cellaria ternata, *Sol.* Ell. Zooph. 30.—Crisia tern. *Lamour.* Cor. Flex. 142.—Scottish coast.

Height scarcely an inch, dichotomously branched; the cells enlarge gradually in breadth towards the top, which is armed with two or three spines; when the outermost one is short, the cell externally has an angulated appearance; at the joints the stem is narrow. This species was sent to Mr Ellis from Aberdeen by Dr Skene. My specimens were found in Zetland.

GEN. LIX. CRISIA.—Cells in two rows; the mouths tubular, with produced margins.

156. C. *eburnea.*—Cells loosely aggregated, cylindrical, bent, tubular orifices free.

Tufted Ivory Coralline, *Ellis*, Cor. 39. t. xxi. f. 6.—Sertularia eb. *Linn.* Syst. Nat. i. 1316.—Cellularia eb. *Pall.* El. 75.—Crisia eb. *Lamour.* Cor. Flex. 158.—On marine plants about low water-mark.

Height about half an inch, dichotomously branched, jointed; surface having a frosted appearance; cells narrow, long, and bent outwardly, placing the mouths far asunder; ovarium an enlarged cell.

157. C. *luxata.*—Cells closely aggregated, cylindrical, nearly straight, with short tubular orifices; joints black.

On corallines, not rare, from various parts of the coast.

Height scarcely an inch, of a firmer substance than the preceding, with which it has probably been confounded, though differing in the following particulars: the branches are broader and thicker in the middle, the cells are shorter and more closely connected, the orifices are less tubular and elevated, the joints are black, and the tubular radicles are annulated with the same colour.

Gen. LX. NOTAMIA.—Cells in pairs, united by the back, a joint above and below.—*Loricaria*, the term employed by M. Lamouroux to designate this genus, having long been pre-occupied in ichthyology, I have substituted *Notamia*,—*νωτος*, *deorsum*, and *ταμειον*, *cella.*

158. N. *loriculata.*—Cells subcylindrical and obliquely truncated.

Coat of mail Coralline, *Ellis*, Cor. 40. t. xxi.—Sertularia cor. *Linn.* Syst. i. 314.—Cellularia lor. *Pall.* El. 64.—Loricaria europæa, *Lamour.* Zooph. 7.—Common a few fathoms beyond low water-mark.

Height several inches, dichotomously branched, fastigiated; the cells are but little prominent, and, as Ellis has well observed, "the opening of each is on a slant near the top, and looks the contrary way to the other; so that the pair together resembles a coat of mail, or pair of stays; and the entrances of the cells look like the places for the arms to come out at."

159. N. *bursaria.*—Cells compressed and attenuated.

Shepherd's-purse Coralline, *Ellis*, Cor. 4. t. xxii. f. 8.—Sertularia bur. *Linn.* Syst. i. 1314.—Cellularia bur. *Pall.* El. 65.—Dynamena bur. *Lamour.* Cor. Flex. 179.

Height scarcely an inch, slightly branched dichotomously; a mesial tube extends throughout the branches, to which the cells are applied like wings; the cells themselves are inversely conical, with a thin edge; the mouth is tubular, produced, and arises near the axis. This species, though related to the former in the position of the cells in pairs, is evidently the type of a new genus, which may be termed *Epistomia.*

Gen. LXI. EUCRATIA.—Branches consisting of a single row of bent cells, the orifices of which have all one aspect.

160. E. *cornuta.*—Branches subalternate, cells, nearly cylindrical, with a tubular orifice, above which is a long spinous process.

Goat's-horn Coralline, *Ellis*, Cor. 42. t. xxi. f. 10.—Sertularia corn. *Linn.* Syst. i. 1316.—Cellularia falcata, *Pall.* El. 76.—E. corn. *Lamour.* Cor. Flex. 149.—Adhering to fuci beyond low water-mark, not common.

Height scarcely an inch, bending; each cell forms a joint, gradually curved, and becoming a little wider towards the top, where it is bent inwards to form an orifice; and on the outer angle the base of the succeeding cell takes its rise, between which and the orifice is the long bristle; ovarium an enlarged, bladder-shaped cell.

161. E. *loricata.*—Branched, subalternate, cells conical, with a raised orifice, beneath which is a spinous process.

Bull's-horn Coralline, *Ellis*, Cor. 42. t. xxii. f. 9.—Sertularia lor. *Linn.* Syst. i. 1316.—Cellularia chelata, *Pall.* El. 77.—E. chelata, *Lamour.* 149.

Height scarcely an inch; shape of the cells like a bull's horn, the base narrow, slightly curved and enlarging to the summit, when it is bent inwards to form a wide marginated orifice; the bristle on the inferior margin is short.

GEN. LXII. ANGUINARIA.—Stem adhering, irregular, cells scattered, tubular, produced, with the orifice on the side towards the extremity.

162. A. *anguina.*—Stem branched, with irregular swellings, from which the cells arise.

Snake Coralline, *Ellis*, Cor. 43. t. xxii. f. 11.—Sertularia ang. *Linn.* Syst. i. 1317.—Cellularia ang. *Pall.* El. 78.—Anguinaria spathulata, *Lamarck*, Hist. An. ii. 143.—Actea ang. *Lamour.* Cor. Flex. 153.—On fuci, rare.

Cells cylindrical, a little swollen towards the rounded and closed extremity, where it is slightly bent, on the upper side of which is a flat, membranaceous, perforated space, the orifice of the cell.

SERTULARIADÆ.

GEN. LXIII. SERTULARIA.—Cells alternate, usually with a joint above and below each.

163. S. *polyzonias.*—Loosely branched, cells smooth, not crowded, wide at the base, with a produced subtubular mouth.

Great tooth Coralline, *Ellis*, Cor. 5. t. ii. f. 3.—S. pol. *Linn.* Syst. i. 1312. —S. ericoides, *Pall.* El. 127.—On dead shells and the roots of fuci, beyond low water-mark.

Height seldom above two inches; more or less branched irregularly; the produced cells give the branches a zig-zag appearance; the margins of the orifices of the cells are irregularly notched, and in some large specimens they are slightly wrinkled across towards the summit; the vesicles (as the ovaria have been denominated) are placed irregularly on the sides of the branches, ovate with a narrow base, wrinkled across, and denticulated at the summit.

164. S. *rugosa.*—Loosely branched, cells wrinkled transversely, crowded, ovate.

Snail trefoil Coralline, *Ellis*, Cor. 26. t. xv. f. 23.—S. rug. *Linn.* Syst. i. 1308.—*Pall.* El. 126.—On fuci about low water-mark.

Height about an inch, irregularly attached to fuci; the crowded cells give the branches a very coarse aspect; the margins of the orifices are jagged; the vesicles resemble those of the preceding species; but they are more deeply wrinkled and notched at the summit.

165. S. *halecina.*—Stem compound, pinnated by alternate branches; cells tubular, produced.

Herring-bone Coralline, *Ellis*, Cor. 17. t. x.—S. hal. *Linn.* Syst. i. 1308. —*Pall.* El. 113.—Thoa hal. *Lamour.* Cor. Flex. 211.—Common, attached to oyster shells.

Height several inches, erect and stiff; base of numerous tubes, which, by uniting, form those larger parallel connected tubes of which the stem consists; the smaller branches are simple, and diverge at a regular angle, each supporting a few alternate tubular cells, with one or two transverse wrinkles; vesicles on the sides of the branches, irregularly oval, with a tube on one side, a little produced at the summit.

166. S. *muricata.*—Stem compound, irregularly branched, cells short and narrow.

Sol. Ellis, Zooph. 59. t. vii. f. 3.—In deep water, on old shells, several fathoms beyond low water-mark.

Height two or three inches; stems erect, irregularly divided; branches short and simple, the joints are well marked; the cells are short and narrow; the vesicles, which are attached to the stem by a short and narrow stalk, are globular, with longitudinal spinous ridges. Though not uncommonly brought ashore by the Newhaven oyster-boats from the Forth, I have never obtained a perfect specimen. The cells, when most entire, seem cylindrical, wrinkled across, and somewhat contracted towards the notched orifice.

167. S. *Templetoni.*—Stems simple; cells short and narrow.

Flem. Edin. Phil. Journ. ii. 83.—Loch of Belfast, Mr Templeton.

Height about an inch; slightly branched; cells narrow, tubular, produced; the vesicles oval, lengthened, narrow at the base, covered towards the summit, with lanceolate spines.—This species is of a more delicate texture than the preceding, the vesicles are of a different shape, and the stem is simple. It was given to me by an accomplished naturalist, the late Mr Templeton of Orange Grove, Belfast. It adheres apparently to a gramineous leaf, probably of a zostera, and therefore may be considered an inhabitant of shallow water.

GEN. LXIV. DYNAMENA.—Cells in pairs, opposite, usually with a joint above and below each.

168. D. *tamarisca.*—Loosely branched alternately; cells cylindric, truncated, with an uneven margin.

Sea Tamarisk, *Ellis*, Cor. 4. t. i. f. 1.—Sertularia tam. *Linn.* Syst. i. 1307. *Pall.* El. 129. *Lamb.* Cor. Flex. 188.—On old shells in deep water.

Height sometimes nearly a foot; branches few, spreading; cells oblique; vesicles narrow at the base, wide at the top, where it is truncated with a short central tube.

169. D. *abietina.*—Branches rather close, alternate, making the stem bifariously pinnated; cells subcylindrical, with even margins.

Sea Fir, *Ellis*, Cor. 4. t. i. f. 2.—Sertularia ab. *Linn.* Syst. i. 1307. *Pall.* El. 133.—*Lamour.* Cor. Flex. 187.—Very common beyond low water mark.

Height nearly a foot; stem arising from wrinkled tubes, which adhere to stones or shells; the cells are usually opposite, sometimes alternate, and the stems seldom exhibit any joints; vesicles egg-shaped, with a narrow base, and a contracted subtubular summit.

170. D. *cupressina.*—Stem with alternate branches, which are

subdivided and panicled; cells subcylindrical, obliquely truncated, and rather close to the stem.

Sea cypress, *Ellis*, Cor. 7.—Sertularia cup. *Linn.* Syst. i. 1308. *Pall.* El. 141. *Lamour.* Cor. Flex. 192.—Common on oyster-beds.

Height upwards of a foot; subordinate branches twice or thrice divided; the cells are short, subopposite; the vesicles are narrow at the base, ovate, truncated, with a subtubular orifice, and a wing-like pointed process at each side.

171. D. *argentea.*—Stem with alternate branches, which are subdivided and panicled; cells conical, diverging, pointed.

Squirrel's tail, *Ellis*, Cor. 6. t. ii. f. 4.—Sertularia cupressina, var. arg. *Linn.* Syst. i. 1308. *Pall.* El. 141.—Sert. arg. *Lamour.* Cor. Flex. 192. —Common on oyster-beds.

Height upwards of a foot; branches sometimes thin and bifarious, or close and panicled; cells subopposite, diverging; vesicles oval; nearly related to the preceding, of which, by many, it is supposed to be a variety.

172. D. *operculata.*—Dichotomously branched, divisions distant; cells opposite, inversely conical, truncated.

Sea-hair, *Ellis*, Cor. 8. t. iii. f. 6.—Sertularia op. *Linn.* Syst. i. 1307.—S. usneoides, *Pall.* El. 152.—Dynamena op. *Lamour.* Cor. Flex. 176.—Common about low water-mark, on fuci.

Height two or three inches; growth usually in tufts; cells pointed externally; vesicles ovate, narrow at the base, rounded at the summit, with a short tubular operculated centre.

173. D. *pumila.*—Irregularly branched bifariously; cells opposite, subcylindrical, diverging and free towards the aperture, which is blunt and emarginate.

Sea oak coralline, *Ellis*, Cor. J. t. v. f. 8.—Sertularia pum. *Linn.* Syst. i. 1306. *Pall.* El. 130.—Dynamena pum. *Lamour.* Cor. Flex. 179.—On Fucus serratus, common.

Height about an inch; growth tufted; each cell seems jointed towards the base; vesicles subglobular, with a narrow foot-stalk, and a slightly contracted truncated summit.

174. D. *rosacea.*—Thinly branched bifariously; cells opposite, cylindrical, and spreading.

Lily coralline, *Ellis*, Cor. 8. t. iv. f. 8.—Sertularia ros. *Linn.* Syst. i. 1306. S. nigellastrum, *Pall.* El. 129.—Dynamena ros. *Lamour.* Cor. Flex. 178. On old shells beyond low water-mark.

Height two or three inches; branches few; cells, where united with the stem, becoming tubular and narrow, suddenly diverging nearly at right angles, and slightly truncated at the extremity; the vesicles are subcylindrical, slightly enlarged at the summit, with several spinous processes.

175. D. *filicula.*—Dichotomously branched, with a cell in the angle; branches short; cells opposite, oval, diverging, with a tubular orifice.

Sertularia fil. *Sol.* Ellis, Zooph. 57. t. vi. f. c. *Lamour.* Cor. Flex. 188.—On the stems of fuci, about low water-mark; not common.

Height about an inch; branches alternate; cells wide at the base, contracted towards the orifice, which is slightly tubular, with a wrinkle or depression forming a shoulder on the upper side; vesicles ovate, with a narrow base, and a contracted subtubular orifice.

176. D. *Evansii.*—Branches opposite; cells opposite, short.

Sol. Ellis, Zooph. 59.—Found at Yarmouth, by Mr Evans.

Height 2 inches; very slender; of a bright yellow colour; vesicles "arise from opposite branches, which proceed from the creeping adhering tube, lobated, and the lobes are placed opposite to one another."

177. D. *pinnata.*—Branches dusky, bifarious, alternate; cells opposite, tubular, and slightly diverging.

Bast. op. 1. t. i. f. 6.—Sertularia pin. *Pall.* El. 136.—S. fuscescens, *Turt.* Brit. Fauna, 213.—On oyster-beds, common.

Height 2 or 3 inches; stems arising from irregular tubular roots; branches rather stiff; cells narrow, where adhering to the stem; summit free, tubular, but less divergent than in S. *rosacea.* According to Pallas, the cells incline to one side (a character I have failed to observe), and from which side the inversely conical vesicles, with their tubular ciliated summits, take their rise.

178. D. *nigra.*—Stem ascending, black, pinnated, compressed; cells opposite, minute.

Pall. El. 135. *Jameson*, Wern. Mem. 565.—Rare.

Height 4 inches; branches rounded, linear, depressed, slender at the base; cells subtubular, minute; vesicles on one side of the stem, subquadrangular. —This species is stated by Pallas as occurring at Cornwall; and, according to Professor Jameson, it has been found on the Aberdeenshire coast, by that illustrious botanist Robert Brown, Esq.

GEN. LXV. THUIARIA.—Cells thin, and imbedded in the substance of the stem and branches.

179. T. *Thuia.*—Stem waved, branches dichotomously divided; cells adpressed, or imbedded in the sides of the branches.

Planta marina equisiti facie, *Sibb.* Scot. Ill. 55. t. xii. f. 1.—Bottle-brush coralline, *Ellis*, Cor. 10. t. v. f. 9.—Sertularia thuia, *Linn.* Syst. i. 1308. *Pall.* El. 140. *Lamour.* Cor. Flex. 193.—On oyster-beds, common.

Height upwards of a foot; stem with alternate branches, which, falling off on the lower part, give it a zig-zag appearance; divisions of the branches slightly tapering; cells compressed, wide at the base, slightly tapering, short, with a small orifice; vesicles ovate, on a narrow short stalk, with a rounded summit, having a subtubular mouth.

180. T. *articulata.*—Stem pinnated, with simple alternate branches; cells adpressed, subalternate.

Sea Speenwort, *Ellis*, Cor. ii. t. vi.—Sertularia art. *Pall.* El. 137.—S. lonchitis, *Sol.* Ell. Zooph. 42.—S. lichenastrum, *Lamour.* Cor. Flex. 194. —On stones in deep water.

Height 3 inches; stem straight, erect, jointed at intervals; branches stiff, a little depressed; cells compressed, broad at the base, a little narrower towards the slightly truncated orifice; vesicles on one side of the stem, ovate, subrugose.

GEN. LXVI. ANTENNULARIA.—Stem verticillated, with slender simple branches; cells distant.

181. A. *antennina.*—Stem erect, simple or alternately branched; branches of the whorls slender, incurved.

Corallina Astaci corniculorum æmula, *Ray*, Syn. Stirp. 34.—Lobster's horn Coralline, *Ellis*, Cor. 15. t. ix.—Sertularia an. *Linn.* Syst. i. 1310. *Pall.* El. 146.—Ant. indivisa and ramosa, *Lam.* Hist. 2. 123.—Nemertesia antennina and ramosa, *Lamour.* Cor. Flex. 163.—On oyster-beds, common.

Height upwards of a foot; stem either straight and simple, or slightly branched, arising from a matted tubular root; cells on the inside of the verticillate branches, distant, unequal, slightly campanulate; vesicles at the upper base of the branches, pedunculated, ovate, with obliquely truncated mouths.

GEN. LXVII. PLUMULARIA.—Stems not verticillated; cells sessile, uniformly distributed on one side of the branch.

* *Stem simple.*

182. P. *pluma.*—Stem pinnated; cells cup-shaped, with a denticulated margin.

Podded Coralline, *Ellis*, Cor. 13. t. xii. f. 12.—Sertularia pluma, *Linn.* Syst. i. 1309. *Pall.* El. 149.—Plumularia cristata, *Lam.* Hist. ii. 125. —Aglaophenia pluma, *Lamour.* Cor. Flex. 178.—On fuci, near low water mark, rare.

Height about two inches; frond lanceolate; branches alternate, simple; cells with a wide mouth; the vesicles are pedunculated, ovate, compressed, slightly bent, with a mesial band above and below, and transverse muricated ribs.

183. P. *pennatula.*—Stem pinnated; cells cup-shaped, with a denticulated margin, supported on the under side by a lengthened incurved spinous process.

Sertularia pen. *Sol.* Ellis, Cor. 56. t. vii. f. 1, 2.—P. pen. *Lamark*, Hist. ii. 128.—Aglaophenia pen. *Lamour.* Cor. Flex. 168.—Sert. pen. *Flem.* Edin. Phil. Journ. ii. 83.—Shores of Devon, Mr Montagu.

Height from about 3 to 6 inches; stem of a brown colour, jointed; branches opposite, curved; the cells are short and wide.—The late Mr Montagu detected this species on the shores of Devon, in 1808, and to whom I am indebted for a specimen.

184. P. *falcata.*—Stems waved, dichotomously divided; pinnated by alternate branches; cells subcylindrical, crowded.

Sickle coralline, *Ellis*, Cor. 12. t. vii. f. 11. and t. 38. f. 5.—Sertularia falc. *Linn.* Syst. i. 1309.—*Pall.* El. 144.—Pl. falc. *Lamark*, ii. 123.—Aglaophenia fal. *Lam.* Cor. Flex. 174.—Very common on old shells, a little beyond low water mark.

Height nearly a foot; weak, leaning; cells closely connected along the side of the branch, and divided by the joints into pectinated masses (thus approaching a Serialaria), the summits obliquely truncated; vesicles ovate, slightly attenuated at the summit. Dr Grant has observed only two ova in each, " large, of a light brown colour, semiopaque, nearly spherical, composed of minute transparent granules, ciliated on the surface, and distinctly irritable."

185. P. *setacea.*—Stem pinnated; branches alternate, a little bent; cells minute, distant.

Corallina setacea, *Ellis*, Cor. 19. t. xi. f. 16., and t. xxxviii. f. 4.—Sertularia pinnata, *Linn.* Syst. 1312.—S. set. *Pall.* El. 148.—Plum. set. *Lamarck*, Hist. ii. 129.—Aglaophenia set. *Lamour.* Cor. Flex. 172.—On fuci in deep water.

Height about 3 inches; stem simple, slender; branches alternate, with a joint between each pair; cells short, distant, and slightly pointed externally; vesicles oblong, subcampanulate, with spinous summits, the spines 10 to 12 in number, base narrow, attached to the stem or at the upper side of the base of the branches.

** *Stems compound.*

186. P. *myriophyllum.* — Stem slightly divided, pinnated, branches recurved; cells cylindrical, adherent, supported at the base by a short obsolete spinous process.

Pheasant's Tail, Coralline, *Ellis*, Cor. 14. t. viii.—Sertularia myr. *Linn.* Syst. i. 1309. *Pall.* El. 155.—P. myr. *Lamarck*, Hist. ii. 124.—Aglaophenia myr. *Lamour.* Cor. Flex. 168.—On the English and Irish coast, in deep water.

Height nearly a foot; stem composed of tubes, closely adhering together; at intervals swollen, marking, probably, the stages of growth; branches simple, alternate, curved; cells with a joint between each, longitudinal, with an even mouth.

187. P. *frutescens.*—Stem slightly divided, pinnated; branches bending upwards; cells cylindrical, adherent.

Sert. frut. *Sol.* Ellis's Zooph. 55. t. vi. f. a.—S. gorgonia, *Pall.* El. 158. (in part.)—Aglaophenia frut. *Lamour.* Cor. Flex. 175.—Scarborough, rare.

Height several inches; stem black and hard; branches alternate; the cells are narrower, and more remote than in the preceding species and are simple at the base.

GEN. LXVIII. SERIALARIA.—Cells cylindrical, parallel, adjacent, in linear masses.

188. S. *lendigera.*—Stem jointed, masses of cells distant, the margins united.

Nit. Coralline, *Ellis*, Cor. 27. t. xv. f. 24.—Sertularia lend. *Linn.* Syst. i. 1311. *Pallas*, El. 124.—Seral. lind. *Lamarck*, Hist. ii. 130.—Amathia lend. *Lamour.* Cor. Flex. 159.—On fuci beyond low-water mark.

Height about an inch; fine, dichotomously divided; cells numerous, towards the upper part of each joint, the upper ones shortest.

GEN. LXIX. CAMPANULARIA.

— Cells bell-shaped, supported on twisted footstalks; tentacula numerous.

* *Stems simple.*

189. C. *geniculata.*—Stem free, flexuous, with bent subclavate joints; cells alternate campanulate.

Knotted Thread Coralline, *Ellis*, Cor. 22. t. xii. f. 19.—Sertularia gen. *Linn.* Syst. i. 1312. *Pall.* El. 117. *Abild.* Zool. Dan. t. cxvii. f. 1, 2, 3. *Lamarck*, iii 120.—Laomedia gen. *Lamour.* Cor. Flex. 208.—Common on fuci within low-water mark.

Root a creeping thread on the surface of fuci, giving rise to simple or slightly branched stems, seldom reaching 2 inches in height; the joints are bent, and an enlargement at the summit supports the lengthened twisted foot stalk of a wide cell with an even margin; the tentacula of the polypi are ciliated with hairs in whorls; the vesicles are placed at the base of the foot stalks of the cells, above, on short stalks, and nearly of the same shape as the cells, truncated with a central, slightly tubular, orifice.

190. G. *dichotoma.* — Stem free, dichotomously branched, joints linear; cells alternate, campanulate.

Sea Thread Coralline, *Ellis*, Cor. 21. t. xii. f. 18.—Sertularia dich. *Linn.* Syst. i. 1312.—Sert. longissima, *Pall.* El. 119.—Camp. dich. *Lamarck*, Hist. ii. 113.—Laomedia dich. *Lamour.* Cor. Flex. 207.—On old shells in deep water.

Height about a foot; stems numerous, arising from a tubular mass, slender, rigid, brown; cells like the preceding; vesicles ovate.—The *Cymodocia simplex* of M. Lamouroux (Cor. Flex. 216. t. vii. f. 2.) given him by the celebrated botanist Dawson Turner, Esq. as found at Yarmouth, appears to have been established from an individual of this species in a depauperated state.

191. C. *volubilis.*—Stem creeping, attached; cells campanulate, with denticulated margins.

Small Climbing Coralline, *Ellis*, Cor. 24. t. xiv. f. 21. A.—Sertularia vol. *Linn.* Syst. i. 1311.—S. uniflora, *Pall.* El. 121.—Camp. vol. *Lamarck*, Hist. ii. 113.—Clytia vol. *Lamour.* Cor Flex. 202.—On corallines from deep water.

Stem embracing other bodies, and sending out slender, twisted, free, footstalks, supporting wide bell-shaped cells.

192. C. *syringa.*—Stem creeping, cells cylindrical, with entire margins.

Small climbing Coralline, var. *Ellis*, Cor. 25. t. xiv. f. 21. B.—Sertularia syr. *Linn.* Syst. i. 1311.—S. volubilis, *Pall.* El. 122.—Camp. syr. *Lamarck*, ii. 113.—Clytia syr. *Lamour.* Cor. Flex. 203.—On corallines from deep water.

Stem embracing other bodies; footstalks shorter than the preceding, the cells are narrower, and slightly truncated obliquely.

** *Stem compound.*

193. C. *dumosa.*—Stem slightly branched, cells nearly sessile, cylindrical, and irregularly distributed.

Sertularia dumosa, *Flem.* Edin. Phil. Journ. ii. 84.—Tubularia tubifera (young), *Johnston*, Edin. Phil. Journ. xiii. 222. t. iii. f. 2, 3.—On Corallines from deep water from Devon to Zetland.

Height nearly two inches, stem erect, slightly branched dichotomously, and composed of several vertical tubes, becoming simple towards the extremity; cells arising from the stem, round, and projecting nearly at right angles; their base narrow, wrinkled, short, their length about twice the breadth of the stem, with an even truncated extremity.—This species has been known to me since 1808, having then found it in the refuse of the oyster boats of the Forth, and subsequently on other parts of the coast. Mr Montagu had likewise observed it in Devon about the same time. It is not unlikely that the yet obscure *Sertularia imbricata* of Adams (Linn. Trans. v. ii. t. ii. f. 5.), may be identified with this species; though the cells be exhibited as ovate or subclavate, and the stem simple.

194. C. *gelatinosa.* — Subordinate branches dichotomously branched, cells on twisted footstalks, campanulate, with even margins.

Corallina filiformis (young), *Ellis*, Cor. 22. t. xii. f. c. C. and t. xxxviii. f. 3.—Sertularia gel. *Pall.* El. 116. *Flem.* Edin. Phil. Journ. ii. 84. and Phil. Zool. ii. 616. t. v. f. 3.—On stones near low-water mark, common.

The base of this sertularia, by which it adheres to stones, is spreading and spongy, and consists of numerous closely interwoven tubular fibres, which rapidly approach to form the stem. The stem rises to nearly a foot in height, and is so flexible as to move with every agitation of the water; it is thickest at the base, where it consists of numerous tubes; but as these diminish in number, until, at the top, there can only be perceived a single branched thread, it tapers gradually to a point: it is nearly straight throughout, and is seldom divided. The branches are disposed round the stem in nearly an alternate order, and as they are longest towards the base, and gradually diminish in length towards the summit, a graceful tapering outline is produced; they occur in pairs which have their origin nearly at the same point; they are not formed from the external tubes, as in some of the other Sertulariæ, with compound stems, but from the central ones, those at the surface turning aside to admit their exit; these branches proceed from the stem in nearly a perpendicular direction, and diverge from each other at an angle of about 45°; each branch is acutely conical, giving out, towards the base, subordinate branches, likewise in pairs, similar to those on the main stem; at last these become alternate, and, gradually shortening, the subordinate stem supports only alternate cells, and either terminates in twin cells, in a single one, or in a clavate mass, containing the rudiments of a future cell and polype. The cells are terminal, and are supported on short footstalks which issue from the stem in alternate order; they are bell-shaped, somewhat produced, with an entire margin. The vesicles are ovate, approaching to cylindrical, with a contracted truncated mouth, covered with a hemispherical lid; they are solitary, nearly sessile, and arise in the divisions of the branches or of the foot-stalks of the cells; at the point of separation of the larger branches there is usually a small twig, supporting 2 or 3 cells with vesicles. The stems are of a brownish colour, opake, and of a firm tough consistence, but in approaching the extremities they become soft, colourless and transparent, so that the central stem of the polype can be easily distinguished; immediately above every division, whether formed by a branch or foot-stalk, there are several transverse wrinkles, varying in number, being seldom fewer than 3, or more than 6; similar wrinkles occur on the foot-stalks at the base of the cells. The stems at the divisions of the branches are a little thickened, while the foot-stalks at the base of the cells are slightly attenuated. The body of the polype is distinctly visible through the transparent covering. In the branches it is somewhat dusky, but becomes paler towards the cells. The foot-stalk of the polype, which corresponds with the foot-stalk of the cell, is narrow, but it suddenly enlarges in the cell to form the body, nearly of the same shape with its covering, at the summit of which the tentacula are disposed in a a circle; these are about 20 in number, linear, blunt at the extremity, and divided into about 10 rough raised joints. Above the circle of tentacula there is a globular head, containing the mouth. The polypes are not verv irritable; for, even when pricked with a needle, they seldom retreat completely within their covering, and when left at rest, soon expand themselves, the summit of the body becoming even with the margin of the cell, and the tentacula diverging or folding backwards on its external surface. When in an active state, I have observed the water taken in at the mouth descend, for the space of several seconds, through the gelatinous parenchyma of the body and foot-stalk, and again return to be ejected. The fluid thus circulating, did not seem to move in a solid body through tubular vessels, but to be divided into minute globules, which permeated a cellular structure.—This species is vivacious, the polypes bearing to be kept out of the water for more than a day without perishing. It is, indeed, a littoral species, living in places left dry every tide. When kept in water, without being changed, the polypes soon contract within the cells, and the body of the polype ceases to be visible in the stems. In some specimens, which I had neglected for upwards of a fortnight, the water not having been renewed during that time, I found all the polypes in the cells shrivelled up, and numerous white threads projecting from the branches. Upon examining the origin of these threads, I found that some of them proceeded from the base of the stems, but in general they were formed from an elongation of the foot-stalk of the denticle, its cup having disappeared. The filaments consisted, as in the stalks from which they proceeded, of a soft covering, and a contained medullary cord. The extremities of these filaments were club-shaped; and soon assumiug the form of a cell, gave opening to the tentacula of a polype which had been formed within. The base of this new cell was annulated, as in the older ones.

195. C. *verticillata.*—Stem erect, slightly branched; cells campanulate, with denticulated margins, supported on long twisted foot-stalks, arising in whorls from the stem.

Horse-tail Coralline, *Ellis*, Cor. 23. t. xiii. f. 20. A.—Sertularia ver. *Linn.* Syst. ii. 1310. *Pall.* El. 115.—Camp. vert. *Lamarck*, Hist. ii. 113.—Clytia vert. *Lamour.* Cor. Flex. 202.—Coast of Cumberland, Dr Brownrig, rare.

Height several inches, stem of straight tubes, each tube giving out cells at equal distances with the other; the foot-stalks are narrow, the cells large and wide.

GEN. LXX. VALKERIA.—Cells ovate, with a narrow base; polypi with 8 regularly ciliated tentacula; stems delicate.—This genus is dedicated to the late Dr Walker, Professor of Natural History in the University of Edinburgh, a laborious and an accomplished naturalist.

196. V. *cuscuta.*—Stem with subverticillate branches; cells usually in pairs, opposite.

Climbing Dodder-like Coralline, *Ellis*, Cor. 28. t. xiv. f. 26. c.—Sertularia cus. *Linn.* Syst. i. 1311. *Pall.* El. 125. *Abild.* Zool. Dan. t. cxvii. f. 1, 2, 3.—Valkeria cus. *Flem.* Wern. Mem. iv. 485. t. xv. f. 1.—On Corallines in deep water.

Height seldom above two inches; several stems usually arise from the same base, filiform, jointed, waved, and support the branches and cells bifariously; branches opposite, nearly perpendicular to the stem, with a joint immediately above their insertion; cells oval, sessile, upwards of 10 times the breadth of the stem, in pairs, at remote distances, projecting, and are probably ultimately converted into branches; sometimes they occur in pairs or crowds in the axillæ of the branches; polypi extend considerably beyond the margin, tentacula with hairs, which, by their motions, cause the water to ascend in a current on one side, and descend on the other, acting, probably, as aërating organs.

197. V. *Uva.*—Stem creeping, irregularly branched, cells scattered.

Grape coralline, *Ellis*, Cor. 27, t. xv. f. 25. D.—Sertularia uva, *Linn.* Syst. i. 1311.—S. acinacea, *Pall.* El. 123.—Clytia uva, *Lamour.* Cor. Flex. 203.—On *Flustra foliosa.*

Stem creeping, much waved, cells oval. This is a species, the true characters of which are involved in considerable obscurity.

* *Stem compound.*

198. V. *spinosa.*—Stem erect, dichotomously divided, waved; cells on one side.

Silk coralline, *Ellis*, Cor. 20. t. xi. f. 17. B.—Sertularia spin. *Linn.* Syst. i. 1312.—S. sericea, *Pall.* El. 114.—Laomedia spin. *Lamour.* Cor. Flex. 208.—On oyster beds.

Height upwards of a foot; slender, like silk; principal stem formed by the union of several tubes, dichotomously divided; subordinate branches alternate, and dichotomously divided; the cells seem confined to one side, rather distant, oval, sessile.

GEN. LXXI. CYMODOCIA.—Stem tubular, annulated below, united above, without any internal partitions; cells cylindrical, filiform, alternate or opposite.

199. C. *comata.*—Stem erect, branches verticillate and waved.

Lamour. Zooph. 15, t. lxvii. f. 12, 13.—Coast of Devon, Dr Leach.

Stem straight, cylindrical, slightly divided; branches capillary, jointed, a minute cell at each joint, with a wrinkled base. Structure yet obscure.

* * *

At the close of this group of animals may be noticed the doubtful *Sertularia pustulosa* of Ellis, Cor. 57, t. xxvii. f. B. It is described as jointed, and alternately but thinly branched; towards the upper part of every joint are several shallow cells, having a little circular rim with a point in the middle of each. Its relations remain to be determined.

TUBULARIADÆ.

GEN. LXXII. TUBULARIA.—Stem cylindrical, jointed, branched; polypi with a prominent mouth; tentacula with suckers, the ovaries seated at their base.

200. T. *indivisa.*—Straight, nearly simple; head with two rows of tentacula.

Tubular coralline, *Ellis*, Cor. 31, t. xvi. f. C.—T. ind. *Linn.* Syst. i. 1301. —T. calamaris, *Pall.* El. 81.—Common on shells from deep water.

Height several inches, some upwards of a foot, rigid, brown; arising from tubular roots; the stem upwards of $\frac{1}{20}$th of an inch in diameter; animal with a slender neck, enlarging towards the outer tentacula, above which the mouth is produced and fringed with a circle of smaller tentacula.

201. T. *muscoides.*—Stems nearly simple, and closely wrinkled; head with two rows of tentacula.

Tubular coralline, wrinkled like a windpipe, *Ellis*, Cor. t. xvi. f. 6.—Polypus ruberrimus, *Bast.* Op. i. 28. t. iii. f. 2.—T. mus. *Linn.* Syst. i. 1302. *Pall.* El. 82.—On shells beyond low water-mark.

Stems numerous, two or three inches in height, regularly jointed or wrinkled, more slender than the last; animal like the last; outer tentacula about 18, inner ones about 12 in number.

202. T. *ramosa.*—Stem dichotomously divided, branches alternate, tentacula in a single row.

Ramified tubular coralline, *Ellis*, Cor. 31. t. xvii. A.—T. ram. *Linn.* Syst. 1302.—T. trichodes, *Pall.* El. 84.—On stones within low water-mark.

Height two or three inches, slender, brownish, branches ascending, annulated at their origin; animal colourless, ovate, tentacula about 10, in an irregular circle.

GEN. LXXIII. PLUMATELLA.—Stem cylindrical, branched, simple; polypi with a depressed mouth and ciliated tentacula.

203. P. *repens.*—Stem adhering, tentacula disposed in a crescent.

Tubularia repens, *Mull.* Hist. Ver. i. part ii. 16.—On the under side of stones, Lochmill-loch, Fife.

Stem extending several inches, irregularly branched, slightly enlarging towards the aperture, dilatable; tentacular margin divided into two lobes, tentacula ciliated in opposite directions. Besides a gullet, stomach, and gut, there is a distinct rectum, terminating in a tubular orifice seated externally to the tentacular margin, out of which I have witnessed the remains of the food swallowed but a short time before, forcibly ejected.

204. P. *gelatinosa.*—Free, branched, tentacula circularly disposed.

Tubularia gel. *Pall.* El. 85.—Found along with the preceding.

Height about two inches, tufted, shrubby; stem dichotomously branched; scarcely enlarging at the extremity; polypi with a bell-shaped disc, the tentacula regularly disposed, and appearing as if webbed at the base; mouth with a valve.

NUDA.

GEN. LXXIV. CORYNA.—Base fixed, head clavate, with distributed tentacula, furnished with suckers.

205. C. *squamata.*—Stem simple, carneous, tentacula linear.

Hydra squamata, *Mull.* Zool. Dan.—C. squam. (from *Pall.* Spic. Zool. x. 36. 41. t. iii. f. 9.—Tubularia affinis, *Turt.* Brit. Faun. 210.—Cor. squam. *Lamarck*, Hist. ii. 62. *Flem.* Phil. Zool. ii. 616, t. v. f. 1.—On fuci.

Height about half an inch; stem round, swelling into an ovate head, varying in form; the mouth is sometimes truncated with a radiated disc; the tentacula are from 5 to 15 in number, longer than the head over which they are distributed, and nearly of equal dimensions throughout; the vesicles are globular, and adhering to the body, at the base of the tentacula, by a short footstalk. The whole colour is pink, with a dark medullary band.

206. C. *glandulosa.*—Dichotomously branched, coriaceous, tentacula with globular heads.

Tubularia Coryna, *Turt.* Brit. Faun. (from *Pall.* Spic. Zool. x. 40, t. iv. f. 8.)—Cor. gland. *Lamarck*, Hist. ii. 62. *Flem.* Phil. Zool. 606, t. v. f. 2.—On stones near low water-mark.

Height nearly two inches, branches wrinkled, head lengthened, oval, mouth small; tentacula thick, wrinkled, with globular heads, which adhere to the fingers when applied; vesicles globular, sessile, scattered over the head; colour tinged with pink, with a dark medullary band.

* * *

We are inclined to consider the *Coryna* as one of the *Tubulariadæ*, having a reduced sheath, and agreeing in the tentacular origin of the ovaria. The *Plumatella*, on the other hand, probably belongs to the *Sertulariadæ*, though its vesicular mode of reproduction has not been detected.

GEN. LXXV. HYDRA.—Free, tentacula terminal, and disposed in a circle, and furnished with suckers.

* *Inhabiting fresh water.*

207. H. *viridis.*—Body linear, tentacula from six to twelve, about the length of the body.

Polype verd, *Trembley*, Mem. 22, t. i. f. 1.—H. vir. and H. grisea, *Linn.* Syst. i. 1320. *Ellis*, Cor. t. xxviii. f. C.—Common on aquatic plants in shallow slow running streams.

Height about an inch, transparent, brownish, or greenish, and consisting of a gelatinous matter, interspersed with minute granular glands. The body is tubular, and open at both ends; simple or branched; tentacula varying in number or height. The food, consisting of small annulose animals, is seized by the tentacula, and conveyed to the alimentary canal, whence, after digestion, it is ejected by the mouth. The absorbed nourishment is dispersed through the glands even to the tentacula. The animal displaces itself and creeps like a leech by the help of its mouth and tail, and even suspends itself from the surface of the water by its tail, which it expands like a funnel for the purpose. The reproduction of this singular being, by buds, issuing from the sides of the parent polype, acquiring tentacula, and then falling off and becoming independent individuals, or by the regeneration of parts when artificially divided, has long engaged the attention of the curious observer. The animals may easily be procured by placing a quantity of the stems of plants growing under water in any slow running ditch, in a basin of clean water; and in a short time the polypi will expand, and exhibit themselves readily to the naked eye.

** *Inhabiting the Sea.*

208. H. *lutea.*—Branched, ovate, truncated, with about ten short tentacula.

Lamarck, Hist. ii. 60.—On fuci, Belfast, Mr Templeton.

Height upwards of half an inch, stem narrow, head much enlarged; tentacula thick, not equal in length to the breadth of the body. The above description is from the drawing of an animal communicated to me by the late Mr Templeton.

209. H. *coronata.*—Body slender, head suborbicular, truncated, with a flat disc; the tentacula issuing at the margin from sheaths which radiate from the centre.

Ellis, Cor. t. xxxviii. f. 5.—On *Plumularia falcata.*

Mr Ellis has given a figure of this animal, which does not seem to have attracted the notice of subsequent observers. He states that it was of a red colour, and that the tentacula " issued out of their sheaths like a starflower."—The true place in the system, of this and the preceding species, remains to be determined.

Facilius mirari et commentari quam vera dignoscere et definire.

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